TELEPHONE ENGINEER

MANAGEMENT

THE NATIONAL TELEPHONE MAGAZINE

SPRING MAINTENANCE NUMBER

LEICH SALES CORPORATION

427 WEST RANDOLPH STREET—CHICAGO, ILLINOIS

NOW YOU CAN APPLY AA-1 RATING TO ORDERS FOR ESSENTIAL MATERIALS

War Production Board Order U-3 now permits telephone companies, under certain conditions, to apply AA-1 rating to orders for essential telephone maintenance and repair parts and, in addition, to assign CMP symbol to materials controlled by CMP regulations.

All telephone men are urgently requested to study Order U-3 and the splendid interpretations and clarifications provided by telephone associations and trade publications. The Leich Organization will be happy to supply you with copies of Order U-3 and assist you in every possible way to "keep 'em talking."

Address

LEICH SALES CORPORATION
427 West Randolph Street
Chicago, Illinois

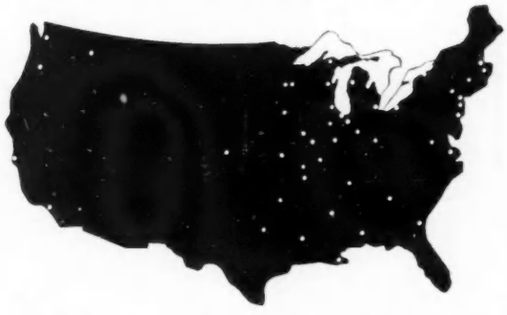
WEAPONS IN YOUR

RWAR ON WEAR

THE LINE SUPPLIES YOU NEED . . .

Depending upon Kellogg as your best source of line supplies pays extra dividends now, when the maintenance of communications is so vital. Your orders, large or small, are handled by men who know your requirements, and assure delivery to you in the quickest possible time.

. . . FROM A NEARBY DISTRIBUTION POINT



No matter where you are, you're never far from a Kellogg distribution point. That's why you can order line supplies from Kellogg with full assurance you'll get the right materials and the best possible service.

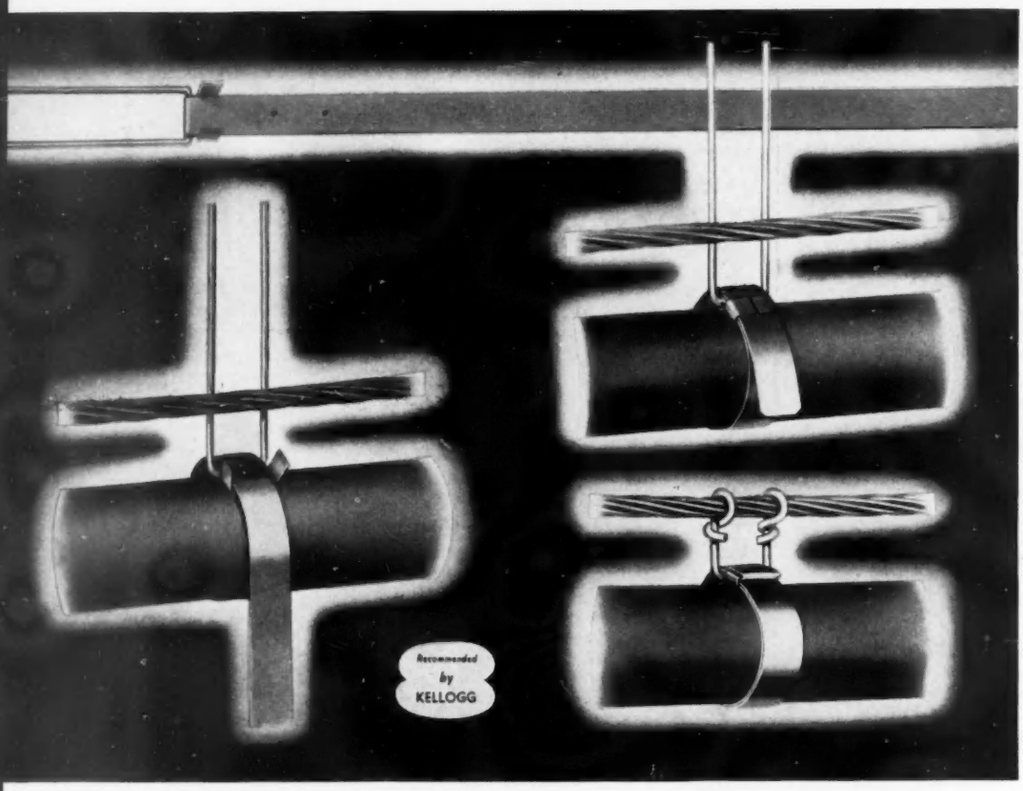
Typical of Kellogg's Effort to Help You Maintain Uninterrupted Communications

This practical booklet is being used by the thousands to help telephone men maintain existing equipment in first-class condition. It's just one example of the many ways Kellogg is assisting the industry meet wartime problems. Copies are available free, on request.

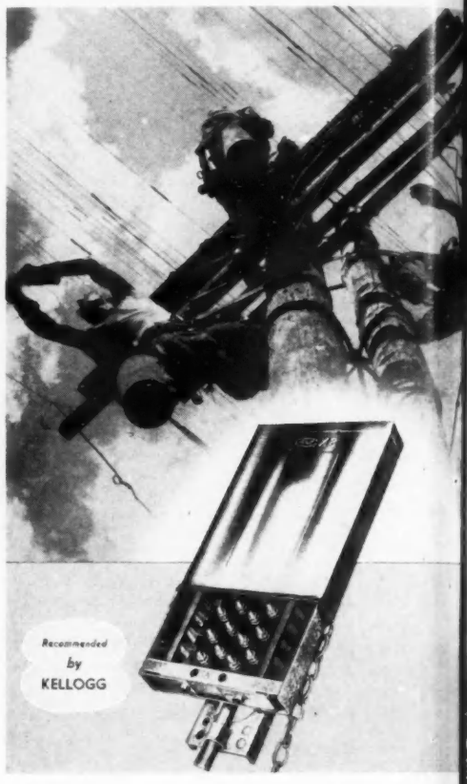
Line Up WITH KELLOGG FOR *Line Supplies*

"HELLO"

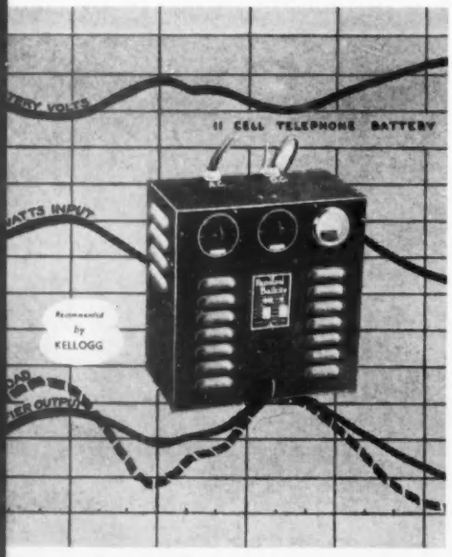
A Pictorial Section of Leading Supply Manufacturers Whose Products Are Distributed by the Kellogg Switchboard and Supply Company.



National Telephone Supply Co. Another step in your "war on wear" is to use Adjust-A-Straps near poles. They suspend the cable away from the strand, preventing friction damage. And because of the "hinge" effect of the broad zinc strap, they allow plenty of play as the cable vibrates, expands or contracts.



Cook Electric Co. Type X-B Cable Terminals are easy to mount close to the pole or wall. They are strong yet light in weight.



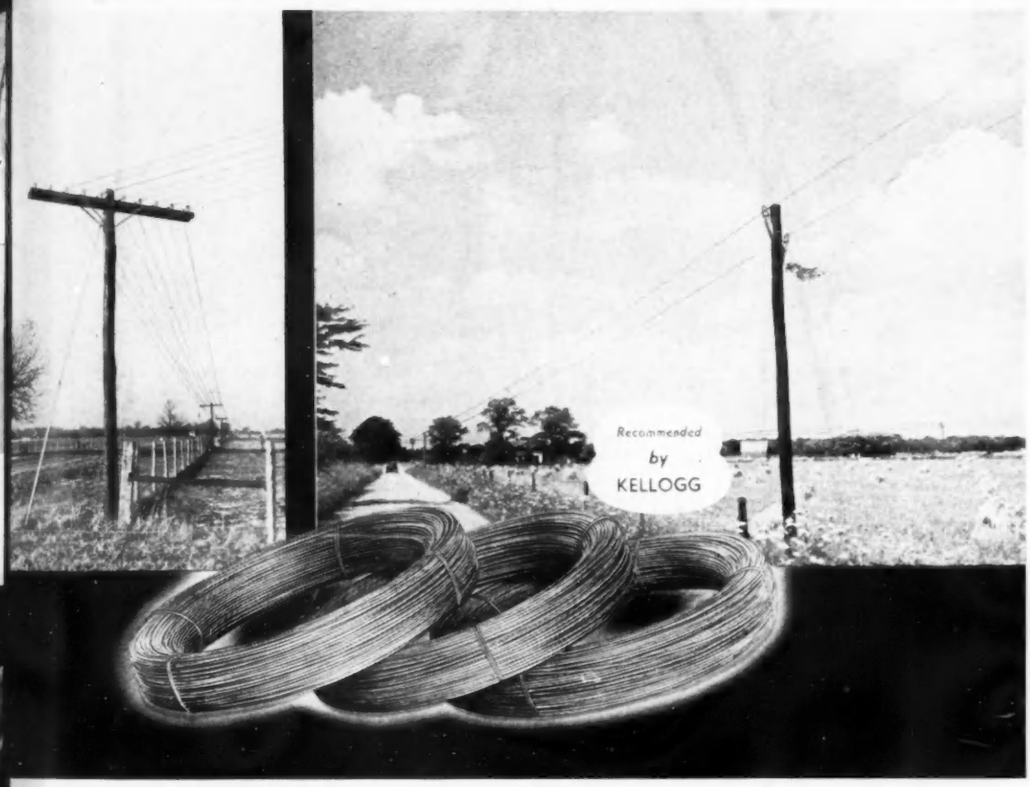
Fansteel Metallurgical Corp. There is no over or under charging of PBX, toll and small central office batteries with Fansteel Taper Rectifiers. The charge rises with increased traffic—tapers off with light loads.

Paragon Electric Co.—Ironite Drop Wire is "armored" for protection against hot winds as well as sleet and ice. In addition, this quality wire saves critical metals like copper, now urgently needed for numerous war materials. Every coil is tagged for your protection.

W. A. Hammond Drierite Co. This shows the new method of drying splices in lead covered cables. With granular *Drierite* Dessicant there is no boiling out old insulation, no objectionable fumes, no harmful effects.

Owens-Illinois Glass Co. Winter cold snaps, spring thaws, summer heat waves may do their worst—but Hemingray Insulators, barring accidents, regularly outlast poles! They are impervious to moisture, temperature changes and age—and possess sustained dielectric strength.

Everstick Anchor Co. Guys are "anchored for good" when you use strong, tough Everstick Anchors. These anchors are easy to install, too, because of the patented nut housing which locks the anchor to the rod during installation and then permits easy recovery of rod.

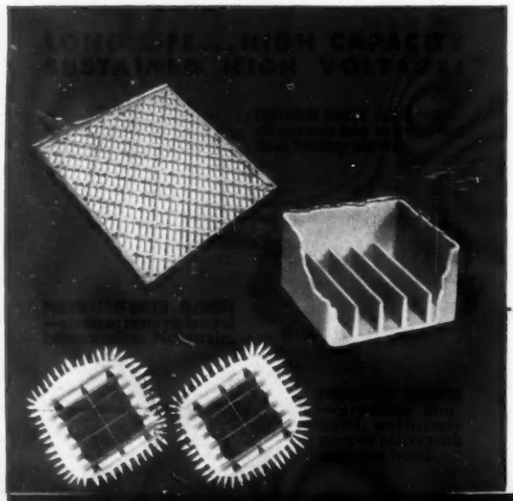


Indiana Steel and Wire Co. Just run your eye along these long spans! Indiana Crapo High Strength Line Wire reduces the number of poles required and makes extensions more economical. And the heavy, ductile zinc coating applied by the famous Crapo process, comes to you as an extra bonus.

ORDER YOUR TELEPHONE LINE SUPPLIES FROM

KELLOGG

SWITCHBOARD AND SUPPLY CO., CHICAGO



WITH EXCLUSIVE PHILCO FLOTÉ CONSTRUCTION

Vitrabloc, Philco's sensational new battery for telephone service, incorporates the famous Philco Floté element — the only battery construction specifically designed for full float service. Philco Floté eliminates low cells . . . produces high capacity, superior conductivity and efficient current distribution.

Philco Vitrabloc cells are explosion-proof, spray-proof and may be placed next to any electrical equipment. Brilliant white, highly glazed, easy to keep clean.

Best of all, no critical materials are used in this vitrified ceramic jar. Philco Vitrabloc is now available on exceptionally low priority! Use the coupon for complete information.

ARMY E NAVY

PHILCO CORPORATION, STORAGE BATTERY DIVISION, TRENTON, N. J.

SEND NEW VITRABLOC FOLDER

NAME_____

COMPANY_____

ADDRESS_____

REPLACE WITH RUGGED, HIGH-CAPACITY PHILCO BATTERIES

The Board of War Communications under director Leighton H. Peebles has been cooperating very nicely with the Independent Telephone Industry. The text of Orders U-3 and U-5 are carried in this issue. We had hoped to summarize his address to the various state association conventions but as this number is our Spring Maintenance Number, space did not permit as we thought you would like to have the text of the new Orders first.

▼

There are prognostications from those supposedly "in the know" that travel will be rationed possibly by mid-summer. It is gratifying that most state associations will have completed their conventions by that time. We suggest you attend your state telephone convention as this might be the last one until after the duration.

▼

We enjoyed visits this month with Lon Jester of Rockford and Vern Clark from Pekin, Ill. With the Iowa Convention coming up immediately this issue is on the press, and subsequent conventions of the Illinois, USITA and Ohio associations we are looking forward to seeing and greeting many old friends of the industry. We hope we see YOU!

Ray.

TELEPHONE ENGINEER

MANAGEMENT · ENGINEERING · MAINTENANCE

& MANAGEMENT

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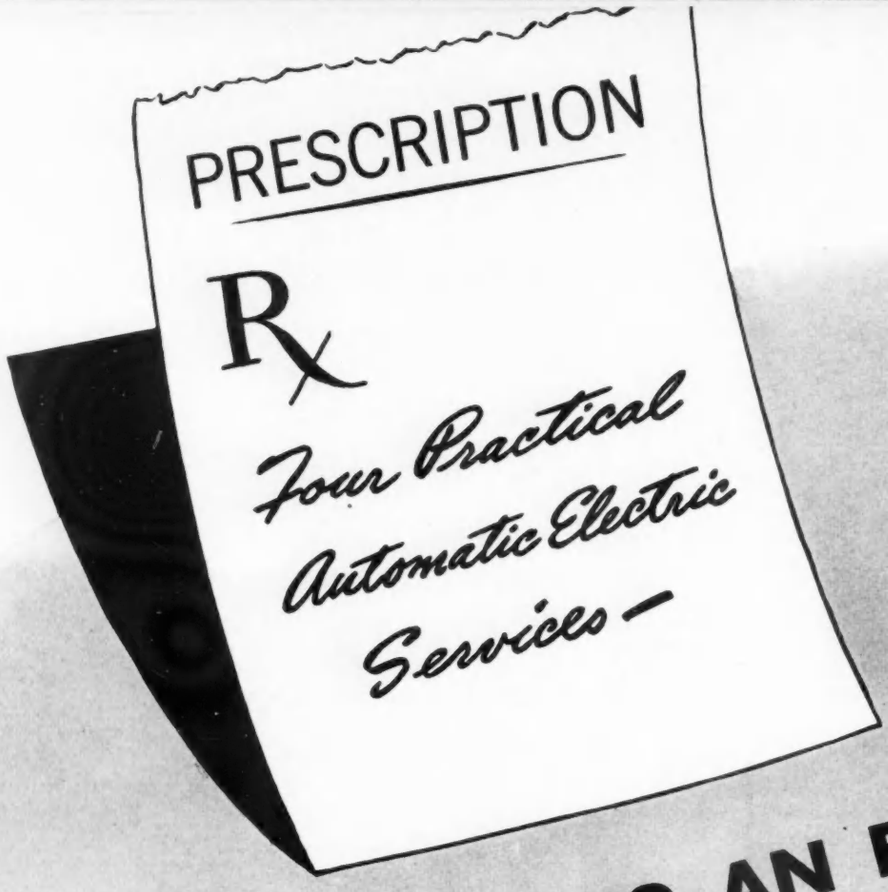
Founded in 1909

Office of Publication, Pontiac, Illinois. Executive and Editorial Offices 7720 Sheridan Road, Chicago, Illinois. Phone Rogers Park 3040. RAY W. SMITH, Editor; ROY F. SMITH, Adv. Manager, DON C. SORENSEN, Sales Prom. Mgr. Subscriptions: U. S., Cuba, Mexico, $1.50 Per Year; Canada, $2.00; In all Other Countries, $3.50. Single copies, U.S.A., 15 cents. Single copy JANUARY 15 BLUE BOOK BUYER'S GUIDE, $1.00. All subscriptions should be sent DIRECT to 7720 Sheridan Rd., Chicago.



for MAINTAINING AN EFFICIENT EXCHANGE DURING WARTIME

It has been a hard winter! But now, like other winters, it's about to become only a memory, and it's time to start repairing its ravages. For instance, straightening poles that have been battling with wind and snow, taking up slack in sagging guys and messengers, replacing broken brackets, crossarms and insulators.

This year, the "spring check-up" is more important than ever—not only to keep users satisfied, but also to keep vital wartime calls going through with maximum speed and dependability.

In spite of our continuing heavy volume of production of telephone equipment for war, we want to help you wherever we can. Here are some practical suggestions to that end. If you need help in more specific ways, call on our field representative. He will be glad to work with you in finding a solution.

The star for continued achievement has been added to this pennant for outstanding production which flies over the Automatic Electric plant.

Plant Maintenance Supply Service—When you ***must*** have new line supplies to meet urgent needs, remember that high quality products will last longer, and thus use less critical materials. We can help you here, because we handle only top quality materials for construction and maintenance—makes that have been time-tried and proved. You'll find complete listings in our supply catalog.

Autelco Rebuilding Service—With new telephones and equipment reserved for the most vital war services, Autelco Rebuild and Return service means more to you today than ever. It keeps your service standards high, avoids the need for new equipment, simplifies your maintenance problems. Our Circular 1640-B gives full details.

Maintenance Advisory Service—Sound, orderly maintenance is a "must" in wartime. The standard maintenance procedures recommended for your equipment are based on long study and wide experience. If you do not have full information regarding the maintenance of your equipment, or if you need help on specific problems, ask our field representatives to help you.

Inventory Advertising Service—Under the inventory restrictions of WPB maintenance and repair orders, telephone companies are getting timely help from our free advertising service. It will help you maintain a balanced inventory by offering your surplus stocks for sale. And, where you are having difficulty in obtaining new equipment, you can make your needs known to others who may have the very apparatus you want. Ask our representative about this service.

The following bulletins, issued by the War Activities Committee of the United States Independent Telephone Association, are of timely interest and value to independent telephone companies in meeting wartime conditions:

War Activities Bulletin No. 2—Conservation of Telephone Plant
War Activities Bulletin No. 3—The Effect of CMP on Telephone Companies
War Activities Bulletin No. 4—The A.B.C. of WPB—A Simple Explanation of WPB Procedure and Orders Affecting the Telephone Industry

If you desire copies of these bulletins write the United States Independent Telephone Association, Munsey Bldg., Washington, D. C., or ask or write one of our representatives.

AUTOMATIC ELECTRIC

ORIGINATORS AND DEVELOPERS OF STROWGER STEP-BY-STEP MACHINE SWITCHING AUTOMATIC DIAL SYSTEMS

MAKERS OF TELEPHONE, SIGNALING AND COMMUNICATION APPARATUS
ELECTRICAL ENGINEERS, DESIGNERS AND CONSULTANTS

Distributors in U. S. and Possessions:
AMERICAN AUTOMATIC ELECTRIC SALES COMPANY, Chicago, U.S.A.
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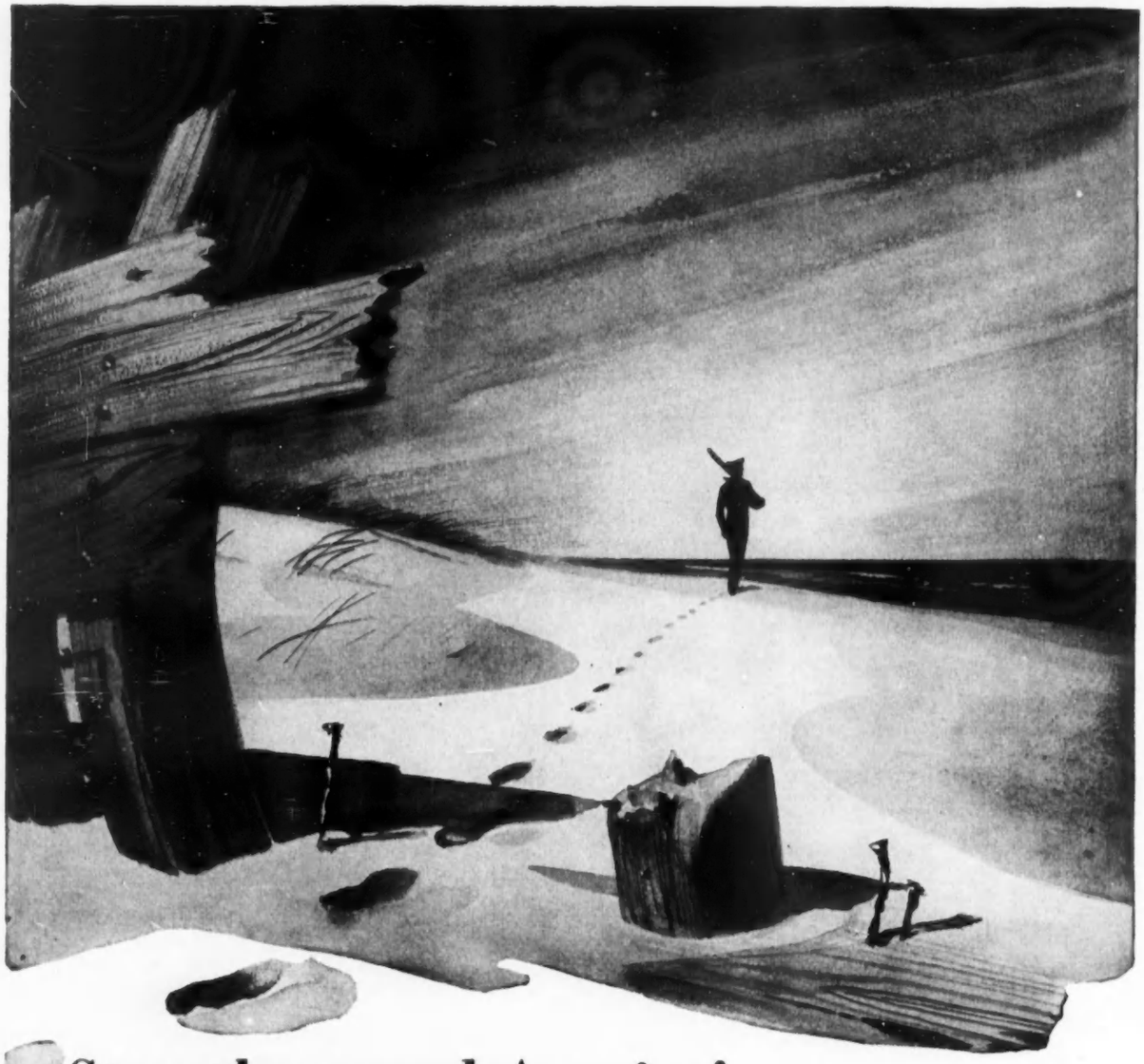


Steps that guard America!

He walks alone. His footsteps, plodding down some unnamed, silent beach, are a trail of protection between you and our Axis enemies.

Within the nation itself, there's a guardian's job we all can share. By caring for our tools and equipment, we make them last longer . . . and so save vital metals, and time, for greater war production. Storage batteries, for instance, last longer when you follow four simple rules of conservation. Obey them and you hit the Axis. Buy to Last and Save to Win!

Exide
TELEPHONE BATTERIES

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
Exide Batteries of Canada, Limited, Toronto

STEPS THAT GUARD BATTERIES!

1. Keep adding approved water at regular intervals. Most local water is safe. Ask us if yours is safe.
2. Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.
3. Keep the battery fully charged—but avoid excessive over-charge. A storage battery will last longer when charged at its proper voltage.
4. Record water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings.

If you wish more detailed information, or have a special battery problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for booklet Form 3225.

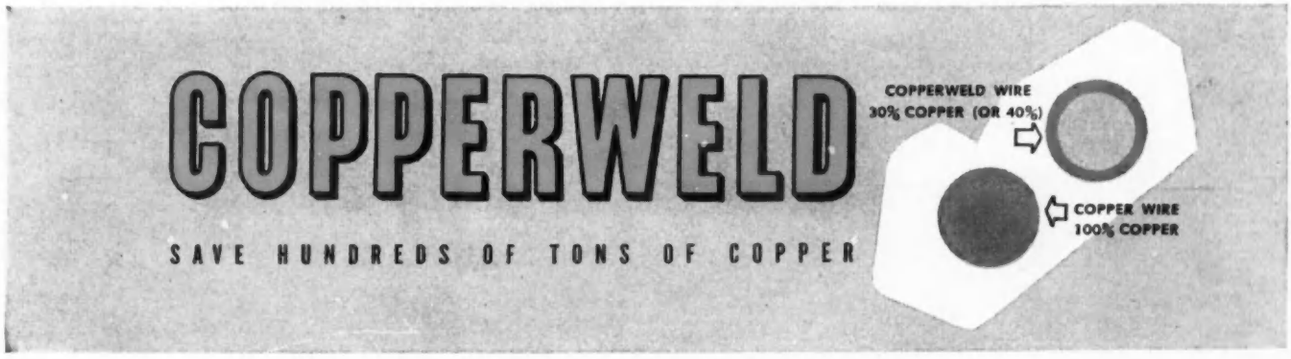
We are in the Copper Saving Business

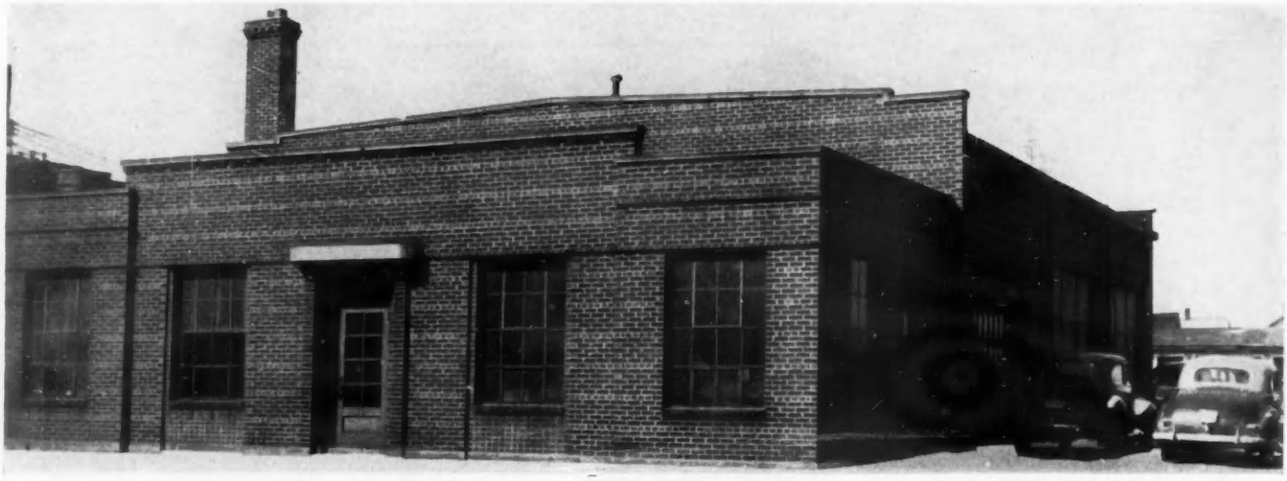
. . . Yes, saving copper is our business. Millions of pounds of copper were saved during our first war year and millions more will be saved this year with Copperweld. Copperweld is saving 60 to 70 per cent of its weight in copper for every foot of it used as power conductors, communication conductors, and in special applications for our Armed Forces.

A plus value to the saving in copper are all the important advantages that go with the use of Copperweld:— strength — rust-resistance — light weight — ease of handling and installation. Our country's available copper supply can be stretched by using Copperweld.

To save copper for Victory, check every job to see if Copperweld won't meet your requirements.

COPPERWELD STEEL COMPANY · *GLASSPORT, PA.*





Yes Sir-ee! We Outgrew Our Britches!

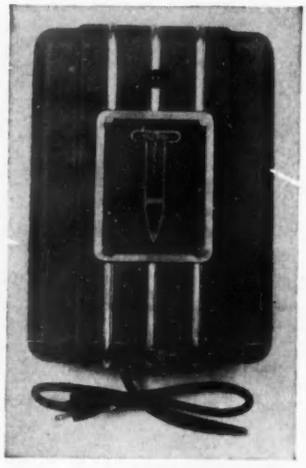
With your government demanding reliable ringing service and depending on TELERINGS plus the recognition of super quality in these instruments by Independent operating companies, Telkor, Inc., soon found their plant quarters inadequate. Today they are housed in the above pictured, modern, spacious building and are operating 24 hours per day in order to supply the demand for TELERINGS.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Reliable Ringing Service Is Essential In Providing Satisfactory Telephone Service—

TELERING

TELERINGS Provide the Most Reliable Service at LEAST Cost.



- Directly Converts Commercial Alternating Current to Telephone Ringing Current—
- Current Consumption NEGLIGIBLE.
- Positively No Radio Interference—

for
ECONOMY
and
RELIABILITY
use
TELERINGS

WHILE "all out" war work in co-operation with our National Government is taxing our production—We are proud we have been able to continue to make satisfactory deliveries to our government and to our many customers in the telephone field.

★

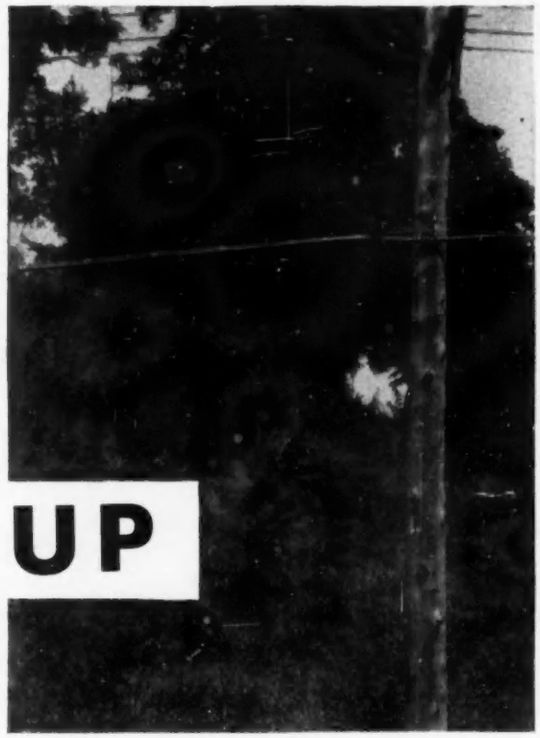
Sold By All Leading Distributors
or Order Direct from

TELKOR, Inc.

ELYRIA, OHIO, U. S. A.

Your CABLES are PRICELESS

Keep 'em.... UP



1. 2. 3. 4.

These four simple steps constitute a complete Reliable Zinc Cable Hanger installation.

Reliable

ZINC CABLE HANGERS

—conserve your cables by eliminating sheath cutting, creeping, rusting and early discard. The life of your existing cables (though badly worn) can be measurably prolonged. The cable is securely bound and solidly grounded to the messenger, providing maximum protection from lightning. Re-hang your cables with Reliable Zinc Cable Hangers and minimize your requirements of the materials essential to the WAR EFFORTS—insure your future service—protect your investment and employ your crews in constructive maintenance. Simple to install.

If your cables are not supported by Reliable Zinc Cable Hangers—request specifications, samples and prices.

Reliable

ELECTRIC COMPANY

OVER 35 YEARS SERVICE TO THE UTILITIES

3145 CARROLL AVENUE • CHICAGO, ILLINOIS

FOR VITAL CONNECTIONS

Although all drops are important some are vital. Monotype Drop Wire is built to serve where absolute dependability is essential. Monotype's conductors, insulation, braid and finish are of a quality that defies rain, sun, wind and ice. Now especially, with replacements practically out of the question due to the shortage of men and material, Monotype's reliability means much to busy telephone companies.

MONOTYPE DROP WIRE

MANUFACTURED FOR

AUTOMATIC ELECTRIC COMPANY
By GENERAL CABLE CORPORATION

DISTRIBUTED BY

AMERICAN
AUTOMATIC ELECTRIC
SALES COMPANY

1033 WEST VAN BUREN STREET · CHICAGO, ILLINOIS

100,000 MILES OF HAULING
EQUAL TO FOUR TIMES THE DISTANCE
AROUND THE GLOBE . . . . LESS THAN
$2.00 FOR REPLACEMENTS
LOW MAINTENANCE
COST IS ESSENTIAL
TODAY . . .

Another Record that Proves FWD's Capacity to Haul Longer For Less

The FWD pictured above — in the service of the Whiting-Plover Paper Company, Stevens Point, Wisconsin — set a record in low-cost maintenance. Right up to the minute the speedometer clicked off 100,000 miles, the total cost of mechanical replacements was less than $2.00—proven by accurately kept maintenance records!

The four-wheel-drive principle — as applied in FWD's — gives these trucks a basically important mechanical advantage, divides strain and fatigue better over the four-wheel-drive chassis — qualifies them to haul longer — more safely — at lower cost.

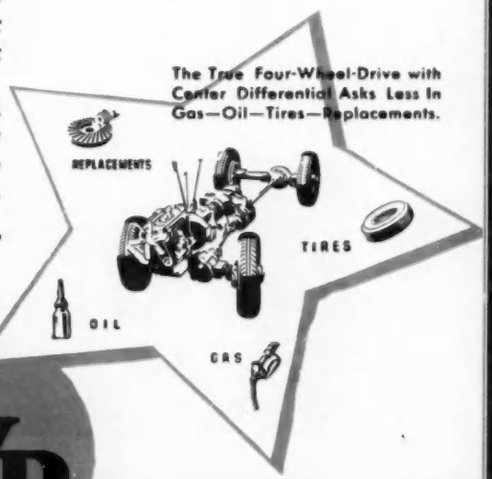
This is another of many "case histories" in the FWD files proving FWD's quality and capacity to haul longer for less — in motor transport, highway service, public utility, oil fields, and other services demanding truck quality that stands up to every test.

Low maintenance cost—an essential in wartime truck operation — is being demonstrated daily by the performance of FWD's in the truck fleets of America.

THE FOUR WHEEL DRIVE AUTO CO.
CLINTONVILLE, WISCONSIN
Canadian Factory: Kitchener, Ont.

• • •

The Oldest and Original Exclusive Builders of Four-Wheel-Drive Trucks



COMMERCIAL

CONSTRUCTION

UTILITIES

OIL FIELDS

MILITARY

FWD Trucks

IN EVERY FIELD WHERE TRUCK QUALITY IS PUT TO THE TEST —FWD's DELIVER

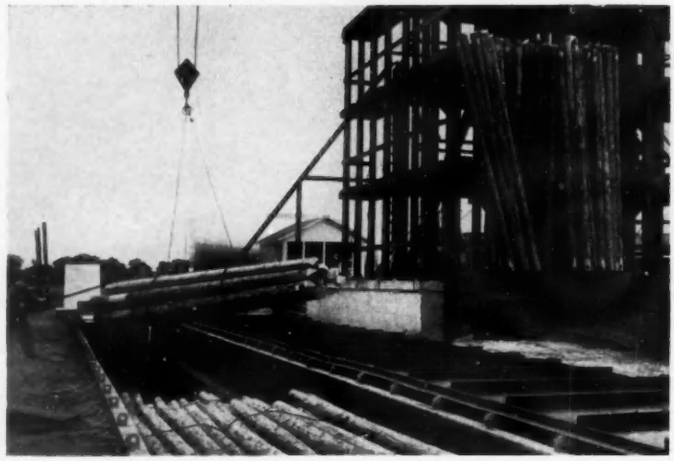
NAUGLE

PENTA POLES

FULL LENGTH TREATED

THERE IS NOTHING BETTER FOR LASTING SERVICE

Many *Extra* years of trouble-free service are added to the already unexcelled long life of natural Northern White Cedar Poles by the Penta full length treatment. NAUGLE, for over 60 years a well known supplier to the telephone field, stakes its reputation on ***EVERY*** claim made for Penta poles.



PENTA'S *Advantages:*

- **1. Brings heartwood durability to the surface making sapwood durability equal to the heartwood.**
- **2. Gives lasting protection against sapwood decay.**
- **3. Protects against insect damage.**
- **4. Prevents corrosive action on hardware.**
- **5. Makes dry, odorless and CLEANER poles.**

Penta means a full length treated Northern White Cedar Pole. Treatment is from butt to top in highly chlorinated phenol solution.

Because the toxic potency of Pentachlorophenol is so great, this full length treatment positively makes the sapwood EVEN MORE RESISTANT to decay than the heartwood . . . something that pole producers have attempted to accomplish for years.

Penta Poles are in stock ready for immediate shipment. We will be pleased to quote you on your next pole order and give you further details.

NAUGLE POLE & TIE CORP.

WESTERN & NORTHERN CEDAR POLES

317 PLYMOUTH BLDG. MINNEAPOLIS, MINN.

TREATING PLANTS: Minneapolis, Minn. Sandpoint, Idaho Spokane, Wash.

25 YEARS AGO THIS MONTH

Taken from TELEPHONE ENGINEER files of April, 1918.

An editorial appearing in April, 1918 TELEPHONE ENGINEER stressed the necessity of discarding the "business as usual" idea during World War I, even as it is being stressed today during World War II. The editorial stated, "No institution, public or private . . . . can hope, by ignoring it, to escape the national obligation."

★

Charles C. Deering was secretary-treasurer of the Iowa Independent Telephone Association (and still is) and spoke on the effects of war on the telephone industry at the 1918 convention. The subject is still timely today.

★

The Texas Convention had over 500 in attendance representing some 700 companies. Unlike today, there were over 30 manufacturers exhibiting equipment. R. B. Still was re-elected president of the Texas Independents and E. C. Blomeyer was elected secretary.

★

An article, "Transmission Efficiencies of Cord Circuits" was carried in the April 1918 issue with Walter C. Freeman, then advertising manager of the Stromberg-Carlson Company, as author. It was delivered by him as a speech at the Canadian Independent Telephone Association.

★

An affiliation of the Northwestern and Tri-State Telephone companies to operate as one system in the state of Minnesota as a wartime conservation measure was considered by the public utilities committee of the St. Paul Association on March 12, 1918.

★

Twenty-five years ago, Senator Sheppard of Texas introduced a bill in the Senate, giving the President power to take over the telegraph, telephone and cable lines and radio stations under the same conditions as the railroads were then being controlled. The purpose of the legislation, he said, was to safeguard channels of communication against German spies.

MANPOWER MUST BE CONSERVED!

Many accidents—some of them fatal—are caused by toppling piles of paper-wrapped coils. This cannot happen with Acorn Drop Wire in Acorn "Safety" cartons.

Note the sturdy construction of the Acorn Carton — heavy duty corrugated board with re-enforced corners.

NO telephone company should expose its men to needless risks at any time. Least of all, today, when lost man-hours due to accidents directly hinder the war effort.

Accidents of this kind can't happen when you use Acorn Drop Wire, put up in Acorn's exclusive "Safety" Carton. Built of extra strong re-enforced material, with flat surfaces—no sliding and teetering. Even when piled 15 to 20 high the weight won't crush those underneath.

Remove this ever-present menace from YOUR stock room. Remember, no other manufacturer of drop wire offers this protection.

ACORN INSULATED WIRE COMPANY, INC.
225 King Street, Brooklyn, N. Y.
LEICH SALES CORP., 427 W. Randolph St., Chicago
LINDSAY SUPPLY CO., 4815 Superior Ave., Cleveland

Acorn "Safety" cartons enable you to pile coils of Drop Wire in high stacks, without risk of injury to your employes.

A Name that Commands Respect

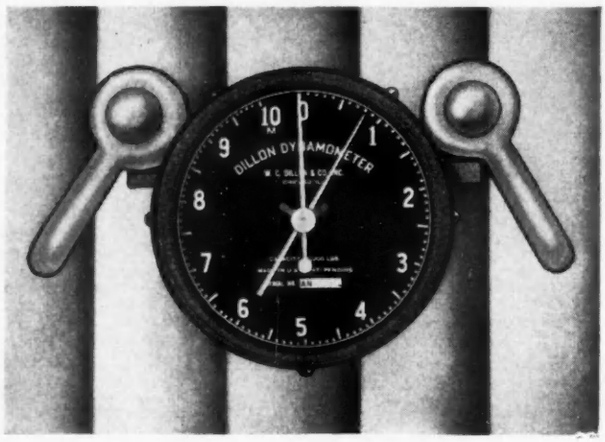
ACORN INSULATED WIRE

Drop Wire	Switchboard
Field Wire	Pothead
Bridle	Cable Terminal
Interior	Instrument
Tree	Fixture
Ground	Buried Wire
Synthetic Insulation	

CORRECT WIRE TENSION IS

Important!

Messenger and telephone wire that is put up "by guess and by gosh" is definitely a weak link in your communications system. The only *dead accurate*, scientific way to assure *correct* wire tension is through use of the DILLON DYNAMOMETER.



MAKE THE JOB RIGHT

It's so downright *easy* to use a DILLON DYNAMOMETER. Can be hooked right in series with a new line going up or may be shunted across *established* wires by hoist or block and tackle. There's no guessing with this rugged tool. It's right—it's light—it's compact. Used by the Navy, the Army, and private industry.

VARIOUS CAPACITIES AT LOW PRICES

MADE TO "TAKE" IT

The DILLON DYNAMOMETER will quickly pay for itself in time and material saving. Properly tensioned wires stay *up* where they belong last *longer*, require *less* maintenance. You will say as others do that this instrument is easily one of the *best* investments you have ever made!

0 to 500 Lbs. (5 Lb. Divisions)	**$ 96.00**
0 to 1000 Lbs. (10 Lb. Divisions)	**$ 96.00**
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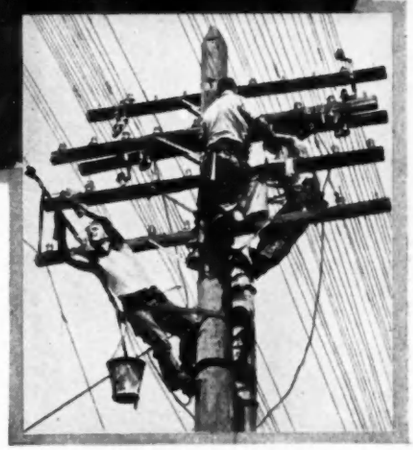

THERE never was a time in the history of the telephone industry when "preventive maintenance" was so essential as it is today. Communication lines must be kept at peak efficiency as a vital aid to the war effort. This demands constant vigilance, skillful planning and the judicious use of critical materials.

Where open wire circuits are involved, it is wise to (1) make a thorough inspection of the line; (2) remove excess sag in the line wire; (3) replace loose and missing ties; (4) tighten or replace guys, where necessary, to strengthen the pole structure.

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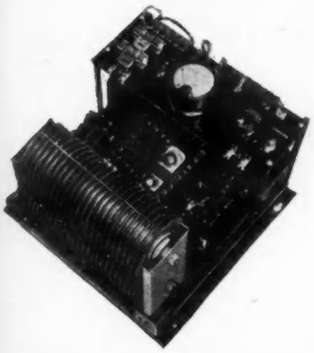

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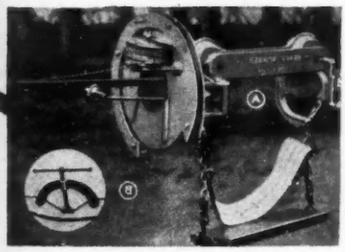

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Manner of attaching lower end of Guard.

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Highlights of the Communications News

Important Communications developments of the past month, briefed for busy readers

by

ROLAND C. DAVIES
Editor, Telecommunications Reports

JUST like every other American industrial field, the telephone industry was confronted with a virtual maze of confusion by the trends and policies which were developing in the National Capital during the early Spring and up until mid-April—these ranged from the tightening manpower situation to varying views as to the critical materials status and embraced also a myriad of post-war planning activities.

Man Power

ON THE manpower front, the filling of the quotas for the armed services from the able-bodied men in the 18-38 age group meant that future industrial draft deferments of such men would be more dubious, as the summer months advanced, even though they were married and were fathers. It was generally regarded that the value of the War Manpower Commission's lists of essential industries, including Communications, is greatly lessened and in fact, may soon generally break down in its validity in being used by local draft boards. The WMC Essential Activities Committee is now seeking a formula to shorten the essential lists so that only actually irreplaceable men in key positions in industry will be covered.

According to authoritative views from WMC and Selective Service officials, the telephone industry can expect that by the end of 1943 only about 500,000 able-bodied draft age men in **all industries** will be left on the essential lists. It is felt that with 12,000,000 men in the armed services and about 2,000,000 frozen on the farms, this quota of 500,000 in industry will be all that can possibly be considered eligible to receive draft deferement. However, the admonition of President Roosevelt that men from 38 to 45 years of age get into essential industries or agriculture may be helpful in the telephone field, because present employees in those age groups are now frozen in that industry, and possibly others can be recruited for the telephone field from non-essential businesses. The Washington authorities have again urged—as they have so frequently in the past—that women be employed in every possible capacity.

Critical Metals

WHILE there have been some opinions emanating from certain Washington circles that some categories of critical metals and materials have become more favorable and thus civilian production in a number of lines can be increased or restored, most of the wiser heads in the WPB and armed services do not hold out such hopes.

First, it must be realized that the Army and Navy supply programs for the next fiscal year, commencing July 1, have not yet been approved by Congress through the latter's appropriating machinery. Second, most of the important critical metals and materials from a military standpoint are still very tight and the WPB leadership is pressing for greater salvaging and conservation by industry—this is particularly true in the WPB recent relationships with the telephone industry. The WPB topflight leaders are not only on the "bear" side in regard to critical materials, but WPB Executive Vice Chairman, Charles E. Wilson, recently gave the tip-off on the critical metals situation by advocating an expansion in the procurement of raw materials in this field.

Military Procurement

THE military procurement of telephone equipment is slated to continue at its present rate for the remainder of 1943, at least, according to indications from the Army Signal Corps and Navy. It is probable that the trend in this procurement will step up in field telephone equipment for use by combat forces and for Lend-Lease shipments to the forces of the United Nations. Because a number of the telephone manufacturing companies have been engaged in supplying of radio equipment for the Signal Corps and, to a lesser extent, for the Navy, a recent forecast from a high Signal Corps source on the future outlook for military radio production is significant. This source warned that due to the material shortages, changes in the Army Supply Program and catching up on the back-log of military require-

Program Announced for USITA Spring Executive's Conference

The Spring Executive's Conference of the United States Independent Telephone Association will convene at the Edgewater Beach Hotel, April 22 and 23 at Chicago. The program will include such nationally known personages as Brig. General Frank E. Stoner, chief of the Signal Operating Services of the Office of the Chief Signal Officer and Roswell Magill, former Undersecretary of the Treasury.

This Conference, a yearly feature, is strictly a business meeting and sessions will begin promptly at 10 a. m. April 22. Registration desk will open at 2 p. m. April 21. The complete program is reproduced on another page of this issue.

Besides the addresses by General Stoner and Mr. Magill there will be reports from Association President John R. Porter, secretary-treasurer Chas. C. Deering and from Clyde S. Bailey, vice president in charge of Association headquarters. The War Activities Committee report will be made on the afternoon of the opening day with Chairman E. C. Blomeyer. The Employment Relations Committee will follow with Chairman John A. Agee in the chair. There will be Open Forums after each committee report.

The new Orders U-2, U-3 and U-5 issued by the Board of War Communications of WPB will be under discussion as will other present day problems of the telephone industry. The various active committees will give their reports during the Conference with most of them scheduled for the second day.

ments, the load upon the radio industry in terms of man hours seems to be declining. However, it was stated, that while the dollar volume is still great and probably will increase next year, this dollar volume will be represented largely by the larger equipments which the small radio producers cannot hope to make, because of lack of engineering skill and production "know-how." It was predicted that smaller contractors for the Signal Corps will show severe production declines by the end of 1943.

Post-War Planning

POST-WAR planning is being launched by both Government agencies, business organizations and major industries. So far, much of the discussion is in the formative stages. The "blue print" of the New Deal, of course, was presented in the report to Congress by the now defunct National Resources Planning Board in its "cradle-to-grave" plan, but Congress so far has been highly scornful of this plan, due to the prospective excessive costs which it would entail and the fact it has killed the Board by refusing any further funds. Secretary of Commerce Jesse Jones has recently brought forth his own views, urging "practical cooperation" in post-war thinking and planning by all segments of American society in formulating their programs for the future to maintain employment at home after the war, and to eliminate international economic rivalries. Secretary Jones emphasized that one of the big domestic issues to be decided will be on the use of the vast Government-owned manufacturing facilities and urged that government and private business get together on plans to utilize them without resort to government ownership and without sacrificing what the government has built up during the war. (He cited that the Government had invested $60,000,000 in plants for producing radio equipment and scientific instruments.)

Another interesting declaration of post-war principles came from the National Planning Association committees, representing business, labor, and agriculture. This advocated unequivocally that the basis of America's post-war economy should be private enterprise with the government performing its Constitutional function of establishing the rules of the game, acting as referee and effecting fiscal policies through taxation and expenditure programs. There should be fullest cooperation and team work between business, labor, agriculture, and the government, the NPA emphasized, as all are dependent upon each other. The annual meeting of the United States Chamber of Commerce in New York, April 27-29, (following right behind the Spring Executive Conference of the United States Independent Telephone Association meetings in Chicago, April 22-23), is to be featured by discussions of the nation's "Post-Victory Democracy". The National Chamber is conducting a most intensive study of post-war planning, and is expected to launch its efforts in this field on a large scale at the New York convention. **The Independent telephone industry has an interesting stake in the U. S. Chamber's affairs, because Carl D. Brorien, former USITA president, who heads the Peninsular Telephone Co. of Tampa, Florida, is a South Eastern vice-president of the U. S. Chamber of Commerce. (Mr. Brorien is at present president of the Florida State Chamber of Commerce.)**

Convention Dates

Illinois Telephone Association, Chicago's Hotel Knickerbocker, Chicago, April 20 and 21.

Spring Executive Conference, United States Independent Telephone Association, Edgewater Beach Hotel, Chicago, April 22 and 23.

Ohio Independent Telephone Association, Deshler - Wallick Hotel, Columbus, April 27 and 28.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 5.

Pennsylvania Independent Telephone Association, Webster Hall Hotel, Pittsburgh, May 13 and 14.

Wisconsin Locally Owned Telephone Group, Park Hotel, Madison, May 18.

Wisconsin State Telephone Association, Park Hotel, Madison, May 19 and 20.

New York State Telephone Association, Hotel Syracuse, Syracuse, May 26 and 27.

Washington and Oregon Independent Telephone Associations, joint convention, Davenport Hotel, Spokane, Wash., June 18 and 19.

California Independent Telephone Association, Miramar Hotel, Santa Monica, June 24 and 25.

U-3 and U-5 Orders

THE priority standing of the telephone industry received a boost over at the War Production Board last week when its preference rating for maintenance, repair and operating supplies was raised under the new Order U-3, revoking P-130, issued April 1 by the WPB Communications Division. Another new order U-5, which took the place of L-148, limits the transfers of wire communication telephone or telegraph to ratings of AA-5 or higher. (Texts of U-3 and U-5 are on pages 31 and 54 of this issue.)

These U-orders were necessary to bring the telephone industry into conformity with the much-heralded Controlled Materials Plan which began active operation April 1, the second quarter of 1943.

At the same time, the WPB allowed the telephone industry an exemption under Inventory Direction No. 1 (under CMP No. 2) which means that telephone companies will be exempted from the 60-day inventory restrictions of that regulation, and ARE subject only to the inventory restrictions in the U-3 order.

Under the U-3 Order, CMP allotment symbol MRO-U, accompanied by a certification, may be used to acquire controlled materials, but it was emphasized by WPB officials, MRO-U CANNOT be used for materials for new construction on war projects. Other CMP allotment symbols will be assigned for such construction.

Only one significant change from L-148 was found in the new U-5 order. This places transfer of equipment from one operating company to another under the CMP inventory provisions. Previously accepted orders were exempted—which bear preference ratings of A-7 or higher prior to Jan. 2, 1943 or bearing a preference rating of A-1-a or higher and accepted by manufacturers, distributors or dealers prior to April 1.

In the U-3 order "operating supplies" are combined with "new operating construction." In the old P-130 order, "new operating construction" was designated separately.

One of the important features of the U-3 order is the exemption allowed the telephone industry in the exclusion for inventory purposes of certain emergency repair materials and non-critical materials. These included any stock of lead-covered cable or bare line wire maintained for the repair of major breakdowns of existing telephone facilities due to storms, floods, etc., as well as non-critical items like poles, crossarms, insulators, non-metallic conduit furniture and office equipment, printing, stationery and office supplies, etc. Incidentally, there was also a provision carried in the U-3 order for material set aside in a reserve to restore plants damaged by ene-

my action or saboteurs, provided it had been authorized by the WPB on PD-200.

It was interesting to note that in contrast to the U-2 order issued last week which only mentioned the Office of War Utilities, the new U-orders stipulated that reports should be filed with Leighton H. Peebles, WPB Communications Division Director.

Naval Communications

THE Directorship of Naval Communications has return to a "flag" rank with the taking over of that post again by Rear Admiral Joseph R. Redman, who returned to the position after having commanded a cruiser in the war zone for over six months. He was promoted by President Roosevelt to the rank of Rear Admiral upon the return to the Directorship.

Admiral Redman succeeded Captain Carl F. Holden who had replaced him as Director last September. Captain Holden left Washington in mid-April to take command of one of the newest battleships. Both Admiral Redman and Captain Holden are among the youngest naval officers who have held the post of Director of Naval Communications.

One of the best known figures in naval communications, Admiral Redman was Director of Naval Communications from February to September, 1942, after having been Assistant Director during 1941. He was assigned in September, 1942, to a sea command. Admiral Redman returns to the Directorship with a wide background of communications experience in the Fleet and Navy shore establishments and an intimate knowledge of world-wide commercial communications.

As Director of Naval Communications shortly after America was plunged into war, Admiral Redman was largely responsible for the vast expansion of the naval communications services, the "eyes and ears" of the fleet. He assisted in the formation of two major wartime communication agencies—the Combined Communications Board which is the communications planning agency for the Combined Chiefs of Staff, and the Joint United States Communications Board which is responsible for coordination of operations and procedures of Army and Navy communications. He also was a member of the Board of War Communications, a planning agency for communications on which non-military agencies of the United States Government are represented. He will again become the naval member on these three boards, replacing Captain Holden, who became the Navy representative when he succeeded Admiral Redman as Director of Naval Communications.

Throughout his naval career Admiral Redman has specialized in communications. He also qualified in submarines and commanded one in the last war.. He was Division Radio Officer from 1921 to 1925, Fleet Radio Officer for the Commander-in-chief from 1927 to 1929, and thereafter served tours of duty in the Office of Naval Communications from 1930 to 1933 and from 1936 to 1939. As Assistant Director in 1941 and Director during 1942, he represented the Navy in communications conferences with government agencies and the Navy Department in its relations with commercial communications enterprises.

He took an important part in formulation of Navy policy before Congress in the study of communications conducted by a Senate committee and in the hearings that led to the enactment of domestic telegraph merger legislation. He is widely known on Capitol Hill as an expert on communications matters.

Captain Holden, like his successor, brought a vast background of com-

(Please turn to page 50)

USITA Executives Spring Conference

EDGEWATER BEACH HOTEL

CHICAGO, ILLINOIS—APRIL 22-23, 1943

★

PROGRAM

THURSDAY, APRIL 22

9:00 A.M. **Registration.**
(Note: The registration desk will be open at 2:00 P.M. on Wednesday)

10:00 A.M. **Call to Order**.....*President John R. Porter*
President's Address.....*John R. Porter*
Report of Secretary-Treasurer.....*Charles C. Deering*
Report from Association Headquarters.....*Vice President Clyde S. Bailey*

RECESS

2:00 P.M. **Address**.....*Brig. Gen. Frank E. Stoner, Chief, Signal Operating Services, Office of the Chief Signal Officer of the Army.*
War Activities Committee.....*Chairman E. C. Blomeyer*
Open Forum
Employment Relations Committee.....*Chairman J. H. Agee*
Open Forum

6:30 P. M.

Directors' Meeting and Dinner

FRIDAY, APRIL 23

10:00 A.M. **Toll Compensation Committee**.....*Chairman E. M. Blakeslee*
Open Forum
Tax Committee.....*Chairman H. V. Bozell*
Address on Current Tax Problems.....*Roswell Magill Former Secretary of the Treasury*
Open Forum
Associations' Coordinating Committee.....*Chairman G. B. Foscue*
Open Forum
Accounting Committee.....*Chairman Ranford Dunlap*
Open Forum

RECESS

2:00 P.M. **Operating Conference—**
(a) Commercial Committee.....*Chairman R. E. Shotts*
Open Forum
(b) Traffic Committee.....*Chairman W. C. Darrow*
Open Forum
(c) Plant Committee.....*Chairman B. C. Burden*
Open Forum

A Wartime Maintenance Article

MAKING A LITTLE GO A LONG WAY

By J. S. REED, JR.

General

ALTHOUGH all new plant construction has been severely restricted, it is still possible for telephone companies to maintain their present plant at a high degree of efficiency by the use of non-critical materials as well as by the careful husbanding of scarce items of equipment. The War Production Board permits the use of new poles, crossarms, and insulators in the replacement of defective items of outside plant equipment under preventive maintenance programs.

The wide-awake telephone man is thoroughly familiar with the principle of preventive maintenance which makes use of the fact that it is far cheaper to repair or replace defective equipment before it becomes so run down that an expensive rebuilding of the plant is necessary. A definite and well-planned maintenance program carried through to its conclusion really conserves critical materials by halting or at least greatly retarding deterioration of these materials. For example, "burning" of a line wire is prevented by the prompt replacement of a defective tie wire; an excessive tight drop wire span is saved from damage by reslackening; and an expensive replacement of badly ring-cut and crystallized cable is avoided by repairing the damaged sections promptly.

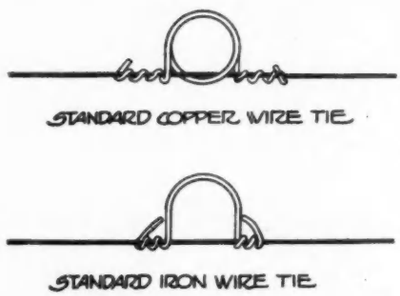


Fig 2—Showing Methods of Making Standard wire ties.

This article discusses methods of overhauling open wire, cable, and drop wire plant that are designed to prolong the life of this equipment and conserve certain irreplaceable items of material.

Maintenance of Open Wire Plant

A GOOD program to follow in the maintenance of open wire plant is to inspect each pole lead periodically, starting at the central office and driving out to the end of the lead. Farm lines spurs should be included in the inspection, down to the protector and substation equipment in order to save later trips, a very necessary thing in these days of tire and gasoline rationing. All repairs and replacements should be made on the spot to avoid return trips. This means, of course, that the maintenance man's truck should be fully supplied with all necessary replacement materials for each trip.

As the maintenance man drives along the pole lead, he should carefully inspect the lead for bad splices and connections, loose or defective ties, broken or missing insulators, defective crossarms and poles, poles out of line, slack guys, and sagging wires. Since spring is a good time for this work,

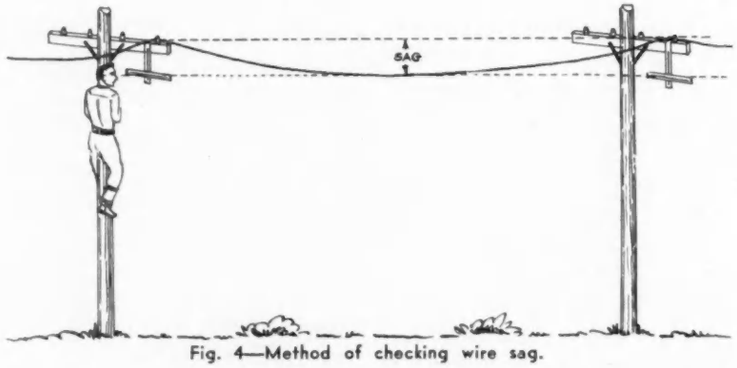


Fig. 4—Method of checking wire sag.

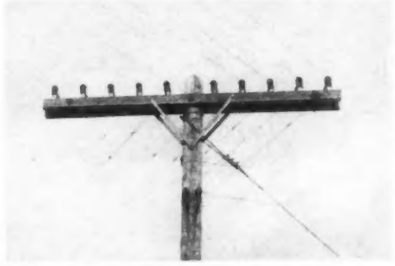


Fig. 3—An example of a good pole corner in a well-maintained open wire lead.

arrangements should be made to cut in transpositions where needed to correct crosstalk and power line inductive interference.

Line Splices and Connections

DEFECTIVE splices are detected by periodic mile-by-mile checks with an ohmmeter. If a section of wire shows an abnormally high resistance, this section should be carefully observed for bad splices. A good tool for checking splices that cannot be reached from the pole is a jointed rod bearing two V-shaped hooks on an arm which can be hung over the wire so that the metal hooks come in contact with the wire on each side of the splice. The ohmmeter is connected to leads running down from the metal hooks for taking readings to determine if the splice has a high resistance. Bad splices are most conveniently replaced by means of compression or rolled types of sleeves. Figure 1 shows the proper steps in making a compression sleeve splice.

One common source of trouble with defective line connections is at the junction of a farm spur with the line. The usual method of connection there is by means of bridle wire and test connectors, which makes it possible for the maintenance man to open the spur for testing purposes. It is very important that good quality test connectors be used for making the connections and that they are tightly set up after making a test. It is bad practice to merely wrap the bridle wire around the line conductor in lieu of using a reliable connector.

Tie Wires

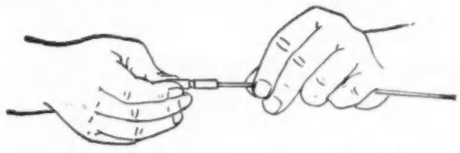
IT is important to replace bad tie wires especially on copper wire lines to prevent damage to this hard-to-replace item. The proper kind of wire tie must be used for the kind of line conductor, that is, annealed copper wire ties for copper wire lines and ordinary iron line wire tie or a special soft grade of iron tie for steel line wire. Figure 2 shows the proper methods of making the ties.

In tying the line wires to the insulators, the wires are usually placed on the side of the insulator nearest to the pole on all pin positions except those for the pole pair. The wires in the pole pair are placed on the side of the insulators away from the pole for greater clearance. However, when the wires pull away from the insulators because of an angle in the lead, all the wires should be placed so as to pull against the insulators. This proper position lessens the chance of damage to the line conductors as the result of their pulling on the ties instead of on the insulators.

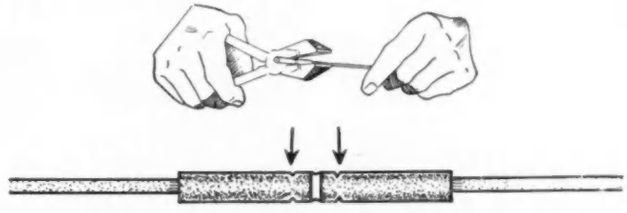
Before making a splice or dead-end BE SURE TO CLEAN THE WIRE. In order to assure that the splice will have good conductivity, it is necessary that NEW as well as OLD wire be thoroughly cleaned. Except NEW galvanized wire need not be cleaned.

Good conductivity cannot be secured from oily, dirty or corroded wire. Abrasive paper or cloth does a good cleaning job. "Nicopress Abrasive Paper," which comes in handy 1½" x 4" sheets, is recommended.

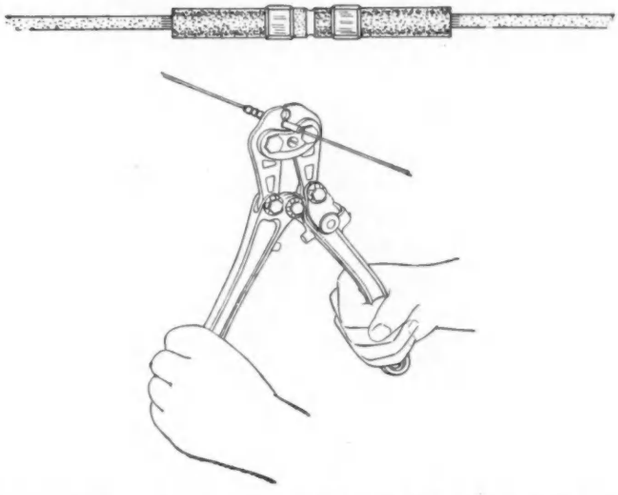
For line splicing push wires into sleeve until they strike the center stop. If wire will not go all the way in to the center stop, do not twist it. Remove the wire, straighten it, and clear the burrs from the cut end. Then push STRAIGHT in.



Pinch sleeve with cutting pliers at each side of center only enough to hold the wires from sliding out of position before splice is finished.



First make the two inside squeezes, closing the tool after each squeeze until the handle bumpers meet.



Then continue making squeezes until entire sleeve is compressed. There should be about 1/16" space between squeezes. When the splice is completed it will look as pictured below.

Fig. 1—Steps in making a compression sleeve splice.

Courtesy, National Telephone Supply Co.

Length of Span in Feet	Temperature in Degrees F.					
	0°	20°	40°	60°	80°	100°
100	3.5	4	5	6	7.5	9.5
120	4.5	5.5	7	8.5	10.5	13.5
140	6.5	7.5	9.5	11.5	14.5	18.5
160	8.5	10	12.5	15	19	24
180	10.5	12.5	15.5	19	24	30.5
200	13	15.5	19	23.5	30	38
220	16	19	23	28.5	36	46
240	19	22.5	27.5	34	43	54.5

Figure 5—Recommended Sag for No. 104 Copper Wire or No. 109 Iron Wire.

Insulators

BROKEN, missing, or "floating" insulators, the latter a probable indication of an unsound crossarm, should be replaced with the proper kind of insulators (No. 9 exchange glass for farm leads and No. 16 for toll lines).

Crossarms

DEFECTIVE crossarms are easily detected by the fact that the insulators have the appearance of "sitting" on the arms as the result of the decay of the wood around the pins which allows the shoulders of the pins to sink into the wood under the weight of the line wires. Closer inspection will show the pin shanks protruding out of the pin holes at the bottom of the crossarm. The obvious remedy is to replace the crossarm.

Occasionally split crossarms may be found. These generally have one or both ends of the arm split along the center line of the insulator pins, so that there is danger the pins will pull out, especially if the crossarm is on a corner pole. Further splitting may be prevented by bolting the split sections together with a ⅜" through bolt at each end. Ten-pin crossarms with split ends, but otherwise in good condition may be salvaged for use as six-pin crossarms by sawing off each end two pins back.

Poles

AS a general rule, a broken pole is replaced as soon as it is discovered. However, on certain occasions, a pole may break off below the ground line and remain upright with little or no sign of its condition. Also, light farm poles after many years of service become decayed below the ground line with no visible appearance of its dangerous condition. A safe and reliable method of testing a defective pole is to shake it vigorously before climbing it. An unsound pole will usually give or break under this treatment. Another way of testing the pole is to gaff the butt below the ground line. This method is open to the objection that holes are gouged through the protected surface of the treated butt, thus providing entrance for fungi to accelerate the decay of what might be an otherwise good pole. To protect himself from possible injury, the maintenance man should make it an inflexible rule to test every pole before he climbs it.

Fig. 6—Trimmed tree on an open wire lead.

In northern climates, frost heaving may cause poles to lean out of line. Such poles are usually loose in the ground and must be tamped back in line. The tamping must be thoroughly done, for loose poles will result in the lead swaying in the wind and placing a severe strain on the line wires and the pole attachments.

A certain amount of pole lean is permissible if the poles are well set in the ground. Poles with ten-pin cross arms may be out of vertical by not more than one foot in fifteen feet of pole height, and those with six-pin crossarms, by not more than one foot for every ten feet. Corner poles, if properly guyed, may lean as much as three feet out of vertical at the top without requiring re-straightening. This does not take into account pole rakes which are usually needed only on very heavy pole leads to relieve strain on poles and guys. Lightly loaded pole leads seldom need to have the poles raked except at angles in the lead and then only to a small degree. Figure 3 shows a properly made pole corner.

Slack Guys—Sagging Wires

AS the result of contraction and expansion of line wires with temperature changes and pole settling and changing position, guy wires may become slack. Guys found in this condition should always be pulled tight, care being taken, of course, not to exceed the strength of the line wires and of the guy itself in the process.

Excessive sag in line wires is objectionable on account of the danger of the line conductors crossing with other conductors and of insufficient clearance from the ground on road cross-overs or at driveways and road intersections. Vertical clearance over roads should not be less than 18 feet; over driveways, it should not be less than 10 feet. A minimum clearance of 27 feet is required in the case of lines passing over a railroad.

Wire sag may be checked by means of sighting targets as illustrated in Figure 4, the amount of sag being compared with a table of sags for the kind of line conductor as shown in a typical wire sag table (Figure 5). In pulling slack in line wires, it should be re-

(Please turn to page 64)

Fig. 7—Use of wood molding for protecting cable passing through trees.

New WPB Orders

BWU Orders U-3 and U-5

(Replaces P-130 and L-148)

Two new utilities orders, U-3 and U-5, relating to telephone materials and equipment, were issued April 1 by the War Production Board.

U-3 replaces Preference Rating Order P-130, which was revoked April 1, and U-5 supersedes General Conservation Order L-148, which also was revoked. Purpose of the new orders is to bring controls over communications equipment and supplies in conformity with the Controlled Materials Plan.

A rating of AA-1 is assigned to operators of telephone systems for materials, other than controlled materials, required for maintenance, repair and operating supplies by Order U-3. CMP allotment symbol MRO-U, accompanied by a certification as set forth in the order, may be used to acquire controlled materials for two purposes; maintenance, repair and operating supplies, and for necessary new construction on war projects. The rating assigned to the project may be extended to communications supplies.

Order U-5 limits the transfers of wire communication equipment, either telegraph or telephone, to ratings of AA-4 or higher, except for previously accepted orders.

We are reprinting the complete text of both Orders:

Text of WPB Utilities Order U-3

Part 4502—Communications

(Utilities Order U-3[1])

§ 4502.1 **Utilities Order U-3—(a) Definitions.** For the purposes of this order:

(1) "Operator" means any individual, partnership, association, business trust, corporation, receiver, or any form of enterprise whatsoever, whether incorporated or not, the United States, the District of Columbia, any state or territory of the United States and any political, corporate, administrative or other division or agency thereof, to the extent engaged in rendering telephone communication service (and such telegraph and teletypewriter service as may also be conducted by him), within, to, or from the United States, its territories or possessions.

(2) "Material" means any commodity, equipment, accessory, part, assembly, or product of any kind.

(3) Without regard to whether or not the expenditures therefor are for any reason required to be recorded in the operator's accounting records in accounts other than maintenance and repair:

(i) "Maintenance" means the minimum upkeep necessary to continue a facility in sound working condition.

(ii) "Repair" means the restoration of a facility to sound working condition when the same has been rendered unsafe or unfit for service by wear and tear, damage, failure of parts or the like.

(iii) Neither maintenance nor repair shall include the improvement of any plant, facility or equipment, by replacing material which is still usable, with material of a better kind, quality or design.

(4) "Operating supplies" means any material (other than that used for maintenance and repair and items listed on Schedule A) which is essential to and used in the operation of communication service by an operator: **Provided,** That such use is permitted under the provisions of Utilities Order U-2, as amended from time to time, and conforms to the limitations set forth in paragraphs (c) (1) (ii), (c) (1) (iii) and (c) (1) (iv) hereof. The term shall also include such items as hand tools, customarily purchased by the employer-operator for sale to his employees for use only in his business, in those cases where they would constitute operating supplies under established accounting practice if issued to employees without charge.

(5) "Operator's inventory of material" shall include all items of new and/or salvaged material and supplies on hand, whether held for current use of for sale as junk, until physically incorporated into plant by way of maintenance, repair, construction or otherwise, and without regard to whether or not such items of material are carried in the operator's accounting records under "Material and Supplies Account." "Operator's inventory of material" shall not include:

(i) Any surplus material listed by the operator for sale on Form UF-6, and filed with the Communications Division, Office of War Utilities as required by said form. Each item of such surplus material shall be identified by the operator for sale to operators for use for maintenance, repair, construction or

[1]Preference Rating Order P-130 has been revoked and is superseded by this order.

"... AND FOR CONSISTENT ABSENTEEISM, MISS FOLSOM, THIS TOKEN OF APPRECIATION - DIRECT FROM BERLIN."

operating supplies. Records of withdrawals from and additions to such surplus equipment shall be maintained and preserved as provided in paragraph (g) hereof, and shall be reported to the Communications Division upon the request of the War Production Board.

(ii) Any material identified for use on projects which have been specifically authorized by the Director General for Operations of the War Production Board or the War Production Board upon application by an operator.

(iii) Any operating supplies which are in the process of being consumed by an operator.

(iv) Any material (other than material ordinarily carried in stock for the day-to-day operations and for emergency repairs) which is, or has been, set aside in a reserve to restore plant damaged by enemy action or sabotage provided that authorization is or has been granted by the Director General for Operations of the War Production Board or the War Production Board, upon application of an operator made on Form PD-200. Any material withdrawn from such reserve shall be used only for the restoration of plant damaged by enemy action or sabotage and such use shall be reported by letter to the Office of War Utilities within thirty days after such withdrawal.

(v) Any stock or lead covered cable or bare line wire maintained by an operator for the repair of major breakdowns of his existing facilities due to storms, floods, etc., reported as prescribed on Form UF-5 unless disapproved by the Office of War Utilities.

(vi) Poles; crossarms; insulators; nonmetallic conduit; furniture and office equipment; printing, stationery and office supplies; house service supplies; and, coal and petroleum products.

(b) Preference ratings, CMP allotment symbol MRO-U—(1) Assignment of ratings. Subject to the terms of this order operators are assigned the following preference ratings:

(i) AA-1 for deliveries to an operator, of materials, other than controlled materials, required for maintenance, repair, and operating supplies;

(ii) For deliveries to an operator, of materials, other than controlled materials, for the construction of facilities necessary to serve such defense projects as may be authorized pursuant to Preference Rating Order P-19-h, bearing a rating of AA-5 or better, the same rating as is assigned to such defense project; except that where such project is assigned two or more ratings and both or all of these are AA-5 or better such deliveries to an operator are assigned the lowest rating which is assigned to such defense projects.

Before applying the preference rating assigned by this paragraph (b) (1) (ii), however, an operator shall first file Form PD—685 with the Communications Division, Office of War Utilities, setting forth in detail the appropriate information requested on said form, and in addition thereto, such other information as may be from time to time required. The War Production Board will thereupon notify the operator if, and to what extent, the application is approved.

(2) **Application or extension of ratings.** By placing on his delivery order substantially the certification set forth below in (b) (4), an operator may apply and a supplier may extend the ratings assigned by (b) (1) (i) and (b) (1) (ii) in the manner provided in Priorities Regulation No. 3 and CMP Regulation No. 3.

An order for materials, other than controlled materials, bearing the rating assigned in (b) (1) (i) or (b) (1) (ii) when bearing the CMP allotment symbol MRO-U, and accompanied by the certification, substantially as set forth below in (b) (4), shall have the same status as a rated order bearing a CMP allotment symbol under all applicable CMP regulations. Such symbol shall constitute an allotment number or symbol for the purpose of CMP Regulation No. 3.

(3) **The delivery of controlled materials.** For the delivery of controlled materials, except aluminum, required for maintenance, repair or operating supplies, an operator is authorized to use CMP allotment symbol MRO-U, and shall place on his delivery order substantially the certification set forth below (b) (4).

An order bearing such certification shall be deemed an authorized controlled material order and shall have the same status as an order bearing an allotment number under all applicable CMP regulations. Such symbol shall constitute an allotment symbol for the purposes of CMP Regulation No. 3.

(4) **Certification for use of ratings and allotment symbols.** CMP allotment symbol MRO-U. Preference Rating.....The undersigned operator certifies, subject to the penalties of section 35 (A) of the United States Criminal Code, to the seller and to the War Production Board, that, to the best of his knowledge and belief, the undersigned is authorized under applicable War Production Board regulations or

(Please turn to page 52)

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A

MANAGEMENT

ARTICLE

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The Author

Economics of

War Time Maintenance Practices

By JAY G. MITCHELL

Off Normal Economics

THE Economics of Public Utility Management are simple in principle but somewhat difficult in effective application. Ordinarily it may be truly said that telephone plant must be maintained in such condition as will result in satisfactory operation and that when, by the lapse of time, the action of the elements, the growth of the demand for service or many other causes, it reaches the age at which the total annual cost of its upkeep becomes unduly high in relation to the revenue it may be expected to produce then it must be retired. This is the normal condition but this condition does not exist in the country engaged in a modern war.

Because of the necessary limitations on material and enlistment of the young men of the nation in the war effort the management of a telephone plant now cannot be adjusted to normal economic principles. Conservation of the plant presently in service and the restricted expansion and limited construction activity of the reduced staff with the maintenance of uninterrupted service to all connected subscribers and toll points become the **prime objects** of the management. This is a distinctive departure from the object sought by management in normal times and substitutes a war ideal (every means to victory) for the usual aim of a reasonable return on an investment in plant which is gauged to afford a cushion for future growth and which is kept in service only as long as it is economically profitable to do so.

Extension of service to additional subscribers, design of plant to accord with the needs of future years as developed by Commercial Surveys, retirement of plant which can no longer be continued in service without incurring excessive upkeep costs, replacement of obsolete items of equipment with more modern types and the promotion of increased usage of the service by the public are relegated to the background. These conditions do not make for easy and effective application of Operating Economic Practices but in war times they must be accorded the primary consideration when the Basic Object of every interest should be the support, in every way, of the national effort to win the victory at the earliest possible moment.

No apology need be offered for the continued reiteration of these facts. Gen. William S. Knudsen recently said "A good part of the public—men and women all around us—has not awakened yet to the seriousness of this war. There are too many good time Charlies not only at the workbenches, but among all of us." The General was demanding more and more production to speed the war effort and his comment illustrates the necessity of subordinating every thing else to activities which are directly helpful. This objective has, of course, been thoroughly adopted by the telephone industry and as the natural result normal Operating Economics have been replaced as guides for Management by other objects which call for the most careful consideration in the planning of Spring Maintenance projects.

Basic War Time Requirement

UNLIKE the maintenance of plant projects of Public Utilities under normal conditions, in war time the prime requirement for telephone companies, it appears, is continued and uninterrupted service toll and local. This objective is of special importance in the presently established telephone service to remote and sparsely settled areas. In such places the facilities for communication with other points are not so numerous and do not afford alternative channels as is the case where many telephone circuits parallel each other and the failure of one does not interrupt reasonably quick and effective communication.

In any location the means of communication in anticipation of an emer-

gency must not be in preventable danger of being interrupted but must be kept in effective operative condition continuously. War, it must be fully realized, is likely to bring about conditions in which rural and toll telephone circuits which reach remote areas may well be the *sole means* of contacting defense headquarters. This is obvious and needs no proof.

In planning Spring Maintenance projects, therefore, management will emphasize somewhat different features of the work than would be the case under normal conditions. All causes of service failure in plant presently in service must be eliminated as far as possible while, at the same time, replacements which call for the use of new material must be kept at the minimum. This calls for a very effective type of Preventive Maintenance and may, unless extreme care is exercised, result in temporary war time overstatement of Maintenance Costs and understatement of Depreciaton Charges. On the other hand it may well result in the final establishment of effective Preventive Maintenance routines by some telephone companies which have not heretofore fully appreciated the importance of so doing. Preventive Maintenance is considered almost essential in normal times but in war times it must be accepted in practice if not in form because the elimination of all preventable causes of service failure becomes, in such circumstances the prime objective of the plant departments.

In case of an attack by airborne troops, for illustration, it is extremely probable that the point of attack will be far away from thickly settled areas. In such an emergency every means of communication must be in operative condition but it is extremely likely that the telephone because of its ease of operation and its comparatively widespread distribution will be the channel of communication over which the alarm will be given. A burden of responsibility rests upon the telephone systems of the nation, therefore, to forestall failures of service which is much more pressing than the normal obligation to supply dependable and continuous service to the public. Never has dependable and uninterrupted service been so essential. When it is remembered that many lives and much property may be saved by the uninterrupted continuity of telephone service previously assured by careful attention to war time preventive maintenance in the plant the importance of adapting Spring Maintenance objectives principally to this object becomes apparent.

Divisions of the Task

SATISFACTORY standards of telephone service require, of course, the co-operation of every department in order that every element of the plant as well as every part of the operation of the system may be free from preventable failure. The physical parts of the telephone system, Central Office Equipment, Subscribers Station Equipment and Outside Plant, however, are involved in any new plan of maintenance while other departments demand especial war time attention. In the daily operation of the telephone system the Central Office Equipment is, or should be, kept at a high point of operating efficiency through the year. This is best done by establishing a system of equipment routining. Under such a system every item of the equipment is subjected to standardized tests arranged to duplicate the conditions imposed by operation and to disclose faulty adjustments, defective equipment items and improper wiring connections. Every telephone office whether it be large or small can and, under present conditions, *should* establish a system of routine tests for the Central Office Equipment which will absolutely identify and eliminate such specific conditions among others as worn plugs, worn jacks, improperly adjusted drops or relays, poor cords, defective keys, unsoldered jumper or other wires, dusty switchboard sections, temporary wires (are temporary wires every properly installed,) missing cam handles, run down primary batteries, neglected storage batteries, worn or frayed operator's set cords and similar conditions which in normal times may, with comparative freedom from criticism be allowed to exist.

Just about the turn of the century the author inaugurated the practice in a large common battery office of having the night switchboard man test one third of all the normal operating conditions of the cord pairs on each position each night. By this arrangement all the cord pairs in the entire office were tested in three days and the effect on the number of complaints of noisy connections, don't answers, and ringing failures was remarkable. This was in the second common battery office ever installed and the results were encouraging that the scope of the routining was expanded until the periodical tests covered the operation of every element of the Central Office Equipment with the happiest results.

Pioneering, however, is no longer necessary and any manufacturer of Telephone Central Office Equipment will be glad to assist in the establishment of testing routines for any style of equipment if requested to do so. Troubles in the central office, by this method, are anticipated and cleared *before they can cause any service failure* and that is exactly the object that the telephone system large and small must keep continually in view as a matter of National Defense in these dangerous and difficult times.

The Economics of this practice are satisfactory. Once established the routining of Central Office Equipment will never be discarded because it will have demonstrated its value as a means of *reducing the overall annual cost of Central Office Equipment maintenance* below the cost incurred by following the outmoded practice of waiting for service failures before making repairs. The improvement in the standards of service, due to the reduction in the number of complaints, will be very apparent.

In the case of the outside plant, which is the part of the system which I have been instructed by the Editor to discuss, the same principles exactly are in control. In order to make sure that service interruptions, which are foreseeable, shall not occur it is necessary, obviously, that potential causes of service failure shall be *definitely eliminated*. This cannot be accomplished satisfactorily by hit and miss methods and while each telephone company will introduce its own detailed procedures the general outline may be set out for consideration. The parts of the Outside Plant to which attention should be given, in the order of their importance, are:

1 Aerial Cable
2 Underground Cable
3 Aerial Wire
4 Pole Lines

Aerial Cable

AERIAL Cable is assigned the position of prime importance because each case of cable trouble may cause service interruptions to several telephone or toll circuits. Cases of cable trouble

(Please turn to page 58)

President and Mrs. Oscar Burton, Tyler, Tex., attended the Texas convention together following their custom for many years.

(Center) Snapped by TELEPHONE ENGINEER'S Roy F. Smith during the directors meeting luncheon are Gertrude Tucker, acting association secretary; Messrs. Bailey, Burton, Peebles, George B. Butler and Jean Shotwell, treasurer, Lufkin, Tex.

(l. to r.) Roy F. Smith, A. L. Robb, Electra, and Fred Trower, Corsicana, are the subjects for son "Dink" Robb who insisted on trying out our TELEPHONE ENGINEER camera. Besides telephone work, Dink is a ranking amateur photographer.

Texas Association War Conference

A STREAMLINED War Conference served as the 38th Annual Meeting of the Texas Telephone Association on March 22 and 23, at the Baker Hotel, Dallas, Texas. The attendance was slightly lower than in past years as the Traffic Conference was dispensed with and only executives and key operating personnel were present. The program was a well rounded one covering conservation of materials, war problems, civilian defense, and other subjects. A bevy of out-of-state speakers including Leighton H. Peebles and Clyde S. Bailey addressed the conference.

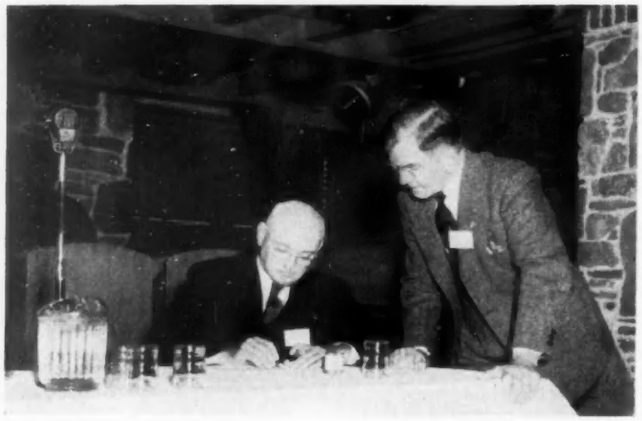
Oscar Burton, vice president and general manager of the Gulf States Telephone Co., Tyler, Texas, was re-elected president as were Sam H. Shutt, Sherman, 1st vice president; R. B. Fairly, Lubbock, 2nd vice president; Jean Shotwell, Lufkin, treasurer, and Gertrude Tucker, Austin, acting secretary.

Elected on the board of directors for a 3 year term were T. P. Bearden, Home Telephone & Electric Co., Baird; R. B. Fairly, president of the Southwestern Associated Telephone Co., Lubbock; A. L. Robb, Electra Telephone Co.; Ralph Sparks, Pecos and N. W. Telephone Co., Pecos; D. T. Strickland, S. W. States Telephone Co., Brownwood; and S. W. Teas, Floresville (Tex.) Telephone Co.; all re-elected. T. A. Singer of the Dimmitt (Tex.) Telephone Co. was the newly elected member. Other directors are: Mr. Burton; D. H. Comparette, Jr., Kerrville; George M. Johnson, Santa Anna; Leonard Mallory, Hubbard City; R. S. Martin, Houston; Walter L. Prehn, Dallas; John Y. Rust, San Angelo; L. Rust, Del Rio; H. T. Shipman, Pecan Gap; Mr. Shotwell; Mr. Shutt; J. E. Stuart, Texarkana; Merton Swift, Sam Marcos, and Fred C. Trower, Corsicana.

The meeting was off to a flying start after the Invocation and the reports of the officers were brief and to the point. With vice president Shutt presiding Mr. Burton made his annual report to the members. He urged those present

Top — Arkansas association president S. A. (Gus) Lane (left) talking over the program with Clyde S. Bailey, USITA vice president, Washington, D. C., LetB Pitcher, and vice president Garland B. Foscue of the Automatic Electric Company, Chicago.

Lower—Leighton H. Peebles; J. M. Lindsey, Kellogg; Clyde S. Bailey; Frank Heyes, Kellogg, and H. W. Vaughn, president of the Alabama association took time to pose for photographer Bob Miles of the Kellogg company.



Texas Association president Oscar Burton and vice president Sam H. Shutt prepare to open sessions at Texas convention.

Merton Swift, San Marcos, an old timer with a steady attendance record stops to chat with E. J. Hardgrove, San Angelo.

that winning the war was our most important occupation but added that post war planning should also be considered. He suggested that newspapers be used in telling the public of the problems of the telephone industry as he found they were very sympathetic and proud of the job being done in communications. Mr. Burton spoke extemporaneously but gave a vivid word picture of conditions now being faced and those on tap for the future.

The report of Mr. Shotwell showed the treasury in good shape and further announced that the association had invested $4,000 in War Bonds. His short report was followed by the report of the acting secretary Gertrude Tucker. George B. Butler is now on leave of absence and is serving as executive secretary of the Texas Salvage section of the WPB.

Captain P. B. Scott, Regional Signal Officer, Signal Corps, San Antonio, gave an address that was of much value to the telephone industry. He outlined the system used by the Army of observation posts in Aircraft Warning Service and the duties they were performing. He urged that all lines, and especially those operating in remote areas and in the sparsely populated rural areas, be checked and double checked to see that transmission was satisfactory. He suggested that in some areas where manpower was scarce that volunteers be called to assist in checking all rural lines be put in shape to serve any emergency. Captain James L. Whitcomb of the Houston area added a few remarks.

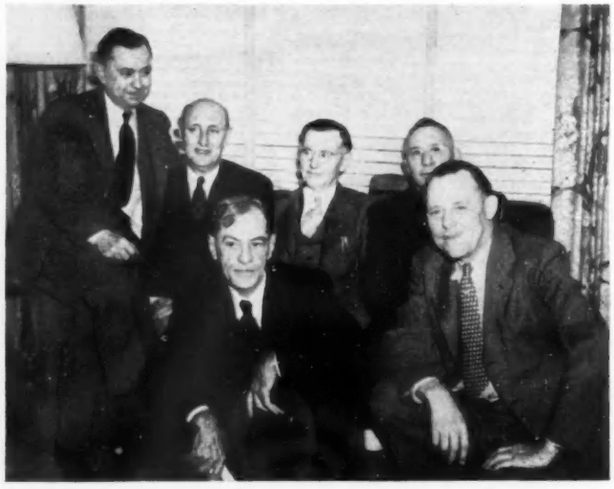
AIR Raid Warning System was the subject of Roy Wade of the Texas Department of Public Safety. The closing address was given by Colonel H. P. Browning, Chief Communications Branch, Headquarters 8th Service Command, Dallas. He spoke on Interrelations of the Telephone Companies and the Signal Corps. Colonel Browning congratulated the telephone people of Texas for the outstanding work they have done and the unusually quick way in which they did their job in co-operation with the Signal Corps. In his closing remark Colonel Browning said:

"Let me say again that your efforts in providing telephone service for this Service Command have been highly successful and they are appreciated. Your co-operation has been splendid. You have done everything we asked you to do. And I consider that we have been fortunate indeed in having available such an efficient industry, as the telephone industry is, to call upon in these times of need."

During the opening session presiding officer Sam H. Shutt introduced many out-of-state visitors. Among these were R. A. Lumpkin, Mattoon, Ill. telephone operating executive and an assistant to Mr. Leighton H. Peebles of the WPB, and H. W. Vaughan, president of the Alabama association. Roy F. Smith, representing TELEPHONE ENGINEER, was busy with the camera to bring you pictures of many of those attending. He received the pleasure of being introduced although a native Texan himself and well acquainted with almost every telephone man in the state. The Editor wishes to thank the Messrs. Burton, Bailey and others that suggested to the Conference that the telephone trade press should be a "must" for every operating company individual.

At the closing session on March 23 president Burton presided. An old friend and co-worker of the association George B. Butler spoke on Conservation of War Materials. As mentioned above he is on leave of absence as secretary of the Texas association and handled his assignment of discussing conservation from first hand knowledge.

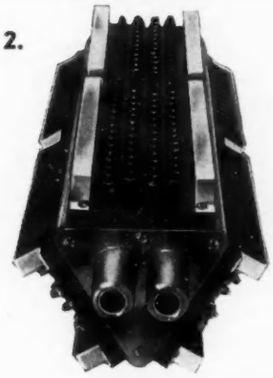
CLYDE S. Bailey, vice president of the National association (USITA), Washington, D. C. was then introduced and spoke to the Texas association on Industry War Problems. He covered the activities of the United States Independent Telephone Association, taxes, priority, manpower and the 48-hour week. Mr. Bailey also outlined the work being done by the War Activities



Gene Reinke, Stromberg-Carlson, Chet Ruth, Cook Electric; S. A. McKie, Brownwood; H. D. Phillips and C. R. Hurmence of Lubbock are to the left of grinning Pete Winemiller.

Modern TERMINATING EQUIPMENT

2.



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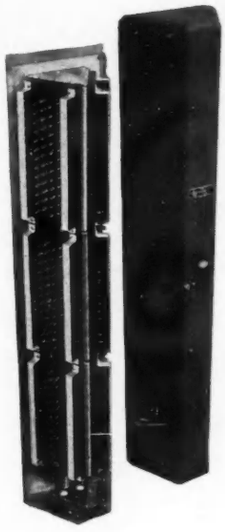

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1. Type XB Cable Terminal One of the most popular cable terminals combining many important advancements in construction, wiring features, maintenance savings and insulation characteristics. Patented one piece Bakelite face plate insulating fanning strip; non corroding studs; cable entrance and cable holding sleeve. Furnished in 6, 11, 16, and 26 pair sizes.

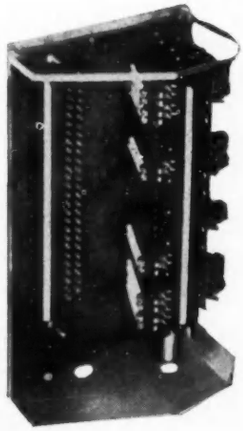
2. Uniflex Cable Terminals A completely new development providing the greatest flexibility and space saving for terminating, distributing, testing and cross connecting telephone cables. Occupies only about one-third the space of ordinary terminals and costs about one-half. For pole mounting in wood or metal pole houses, in Cook terminal vaults or for outdoor use.

3. Cook Terminal Vault For mounting the Uniflex Cable Terminal, the Terminal Vault requires only about one-third the space of old style locker type cabinets. Can be furnished for individual requirements in any size or to cover any arrangements of Uniflex Terminals. Greater working accessibility.

4. Type TN Interior Cable Terminal. For the termination, protection and distribution of paper wrapped, lead covered cable serving P.B.X. units and unattended exchanges. No silk and cotton cable tip required. Makes cross connections easy under nut and washer terminals, 100% working accessibility. Furnished in 26, 51, and 101 pair sizes.

5. Terra Term Underground Distributing Unit An easily assembled and installed unit for terminating, cross-connecting and distributing underground cable at airports, war plants, firing ranges, police and fire alarm systems, P.B.X. systems, railroad communications and air raid alarm systems. Capacity ranges: 26 to 152 pairs in and out.

6. Type IT 20 Interior Cable Terminal Especially designed for terminating and protecting cables and substation equipment in barracks, war plants, etc., where protection is required on both the cable and drop sides. Furnished in 11, 16, 26 and 51 pair sizes. May be used separately or as part of the Trans-Mount System of Protection and Distribution.



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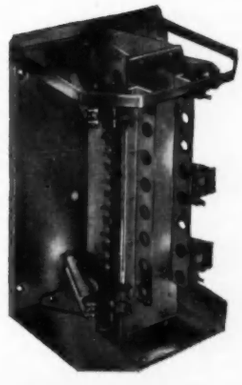

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COOK ELECTRIC COMPANY
2700 SOUTHPORT AVENUE • CHICAGO

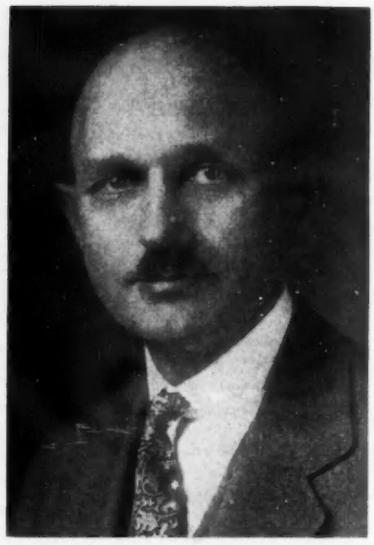
Committee and the association in regard to Bulletins being issued to make the war job a bit more understandable to telephone men. (The Bulletins appear in these columns as they are issued.) Mr. Bailey was making his first appearance before the Texas Telephone Association and his address was roundly applauded.

Leighton H. Peebles, Director, Telephone Communications Branch of the War Production Board, was the final speaker on the program and delivered the keynote address of the Conference. Space permitting we are summarizing his address in another part of this issue.

The manufacturers serving the industry altho not exhibiting were on hand to confer with their customers and aid them in planning for the future. This service is proving very valuable and much comment was heard commending them for their interest and assistance during a time when sales are almost at a standstill.

Here 'n there at the Texas Convention

Mr. and Mrs. Ira Fullerton of Denton . . . **"Dink" Robb** and his lovely wife, Electraites . . . . Dink brought his father, **Al,** along as usual . . . . **T. P. Bearden** of Baird . . . the **Fred Trowers** of Corsicana . . . Sporting a new spring bonnet, **D. T. Strickland** of Brownwood, home of Camp Bowie . . . **Morris Burton,** son of Oscar, reporting for a physical soon . . . . **"Doc" R. B. Fairly** wearing that ever-present smile . . . . Thanks for the invite to go deer hunting, **Jean Shotwell** . . . Glad to see you, **Jimmie Stuart,** Texarkana . . . Makes one feel good just to see **Walter L. Prehn,** Dallasite . . . . Charming hostesses, **Mesdames Oscar Burton and Sam Shutt** . . . a long way from home, **Leighton H. Peebles** and **Clyde Bailey** from Washington . . . How's things down Houston way, **R. C. Martin ? . . . Paul K. Rhoads,** Reliable Electric and **A. M. Michael** of Exide, two good looking dudes—and popular . . . . Officers of the Signal Corps at every turn . . . . Hi There! **George Butler,** glad to hear your wife is well on the way to recovery . . . . **R. C. "Red" Ryon** of North Electric, **Howard Howsley** of the Automatic and **Frank Eldredge** of Philco Battery and Ray-O-Vac could vie for the title "best dressed man" . . . . Um! Umm! those big red apples being handed out by **Dave Borden** of National Carbon . . . . **Lon Jester** from Rockford, Illinois, former Texan is right at home at Texas conventions . . . . **H. W. Vaughan,** president of the Alabama Telephone Association, had to sit up all night on the train as did "ye" reporter. Hope those licky stiffs who



H. B. Couch, was re-elected Secretary of the Kansas Association.

well . . . . so long, gotta catch up on my sleep and try to get the coach-seat blues out of my bones.

With that usually shiny dome all blistered and a chapped smile, **R. H. Burfiend,** regaling friends of his fishing trip at Acapulco, Mexico. As usual the biggest one got away, said Burf.

Kansans Meet At Topeka

Well over 100 telephone men assembled at the Hotel Jayhawk, Topeka, Kan., March 25 and 26, for the annual convention of the Kansas Telephone Convention. They were rewarded by a program covering all phases of war-time telephone operating and heard several nationally known personages address their meeting.

Samuel Tucker of Pleasanton, Kans. was re-elected president of the association. Vice president Walter Pedigo, Pratt; Treasurer Estella Henderson, Pleasanton, and Secretary H. B. Couch were also re-elected. The following members of the Executive Committee were re-elected for a 3-year term: Foster Laming, Tonganoxie; F. M. Browne, Kansas City; W. C. Wilkin, Nortonville, and Mr. Pedigo.

President Tucker presided the first day and gave the address of welcome. He pointed out the need for co-operation between the communications industry and the government to accomplish the desired end—Victory for the United States. Mr. Tucker is locally known as "the Telephone Sage of Kansas" and gave those attending a very inspirational talk.

Charles C. Deering, secretary-treasurer of the USITA represented that association and gave a review of national affairs as well as discussing the toll compensation situation.

Alden L. Hart, president, United Utilities Co., Inc., Abilene, spoke on the subject of "Postwar Planning" and predicted that business should improve in the years to follow. The Utilities Division of the Kansas Corporation Commission and the Wage and Hour Division of the U.S. Dept. of Labor co-operated by having representatives present at the hotel during the convention.

Instead of the usual banquet and dance a continuous showing of movies of the telephone's part in the war was shown during the evening of opening day.

The morning session of the second day was well attended to the surprise of many. Wayne E. Limbocker, chief engineer for the Kansas Corporation Committee gave the address of Jeff A. Robertson, chairman, who had to be in Utah. He reviewed the life of a commissioner and his viewpoint concerning various cases before the commission, all in an off-hand way that was very pleasing. His only personal remark to the telephone men was not to let the post-war period catch them with their plants down.

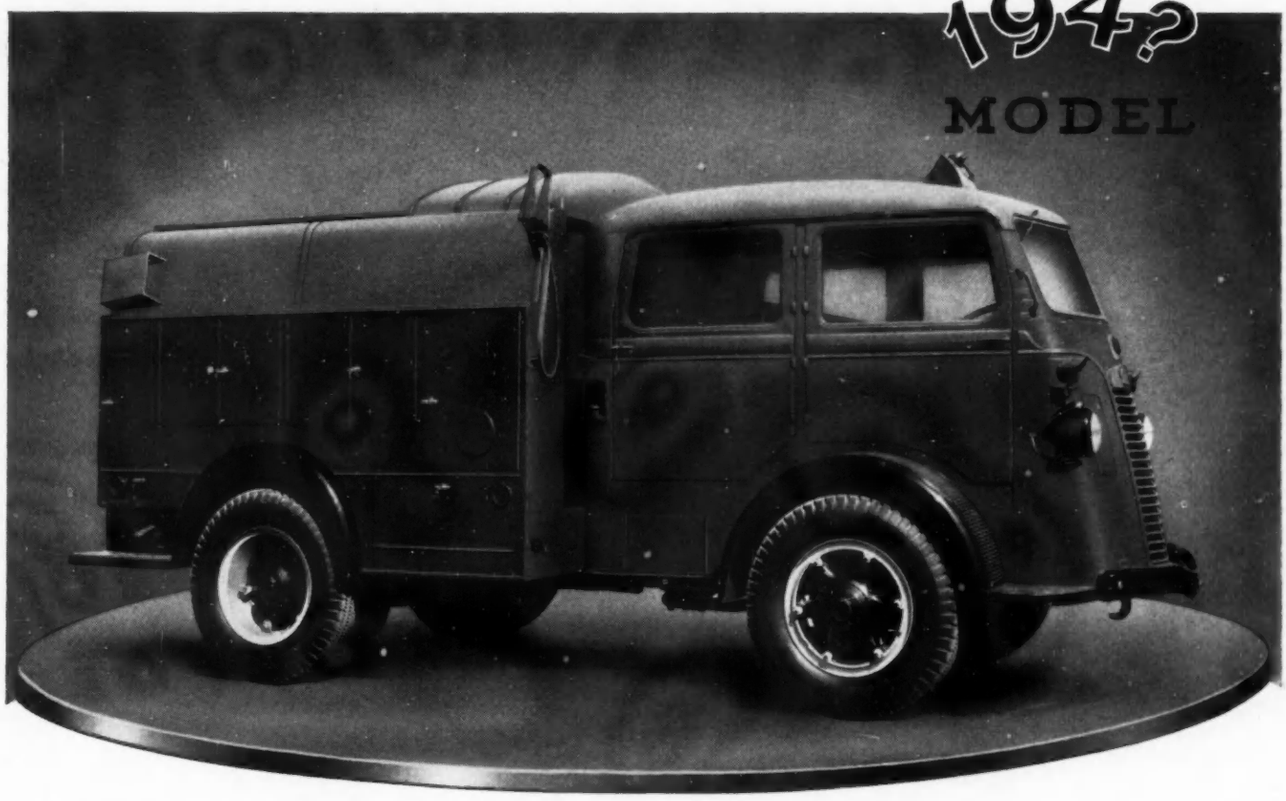
M. A. Osborne, plant superintendent of the Western Light & Telephone Company read the Number 2 Engineering Bulletin of the USITA. Some discussion followed regarding the practice of economy of materials in operation.

"How It Looks To Me" were really good short sketches by Foster Laming of Tonganoxie, Walter Pedigo, Pratt, W. H. Reilly, Topeka and Rosemary Harris of Norton.

Illinois Convention Next Week

Readers of TELEPHONE ENGINEER are familiar with the program of the Illinois Telephone Association convention to be held at Chicago's Hotel Knickerbocker April 20 and 21. Secretary A. J. Parsons expects a sizeable attendance as the meeting will precede the Spring Executive's Conference of USITA that will be held the next two days at the Edgewater Beach Hotel, Chicago. A large number of out of state visitors are expected. Complete program was carried in our issue of April 1 on page 11.

As a special treat those in attendance will hear DeLoss Walker, former editor of Liberty Magazine who has had considerable experience in China and Japan, and a lecture by Charles Milton Newcomb, nationally known humorist.



Yes, it may look familiar—it's the old 1941 model all right—but it was built in the best York-Hoover tradition—with plenty of tough materials put together to stand hard use.

Uncle Sam is using all the bodies we can produce now. He says 1943 is going to be the same. The same order goes until we win this war—until we drive the Nazis into the wall and the Japs into the sea.

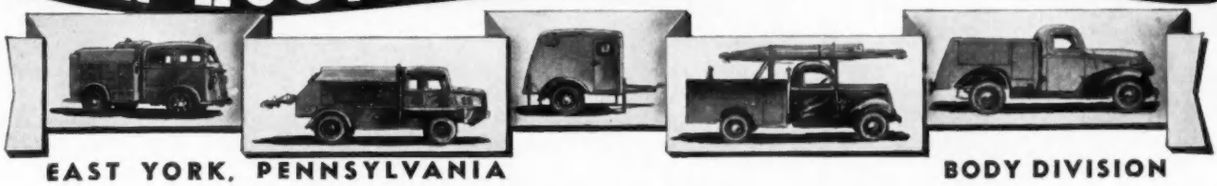
We won't bet on how long that will be—we will bet that we're headed for Victory.

And another thing we'll wager—there are thousands of York-Hoover bodies on chassis today—have been working right through 1942—which will be in use when the war is over. They were built to take it.

York-Hoover men worked long and hard to get the Army-Navy "E" award that flies over the body plant. They are going on working long and hard to hold it. And after the war is won they will be ready to turn their ability, their war experience and their reputation to making better bodies for you.

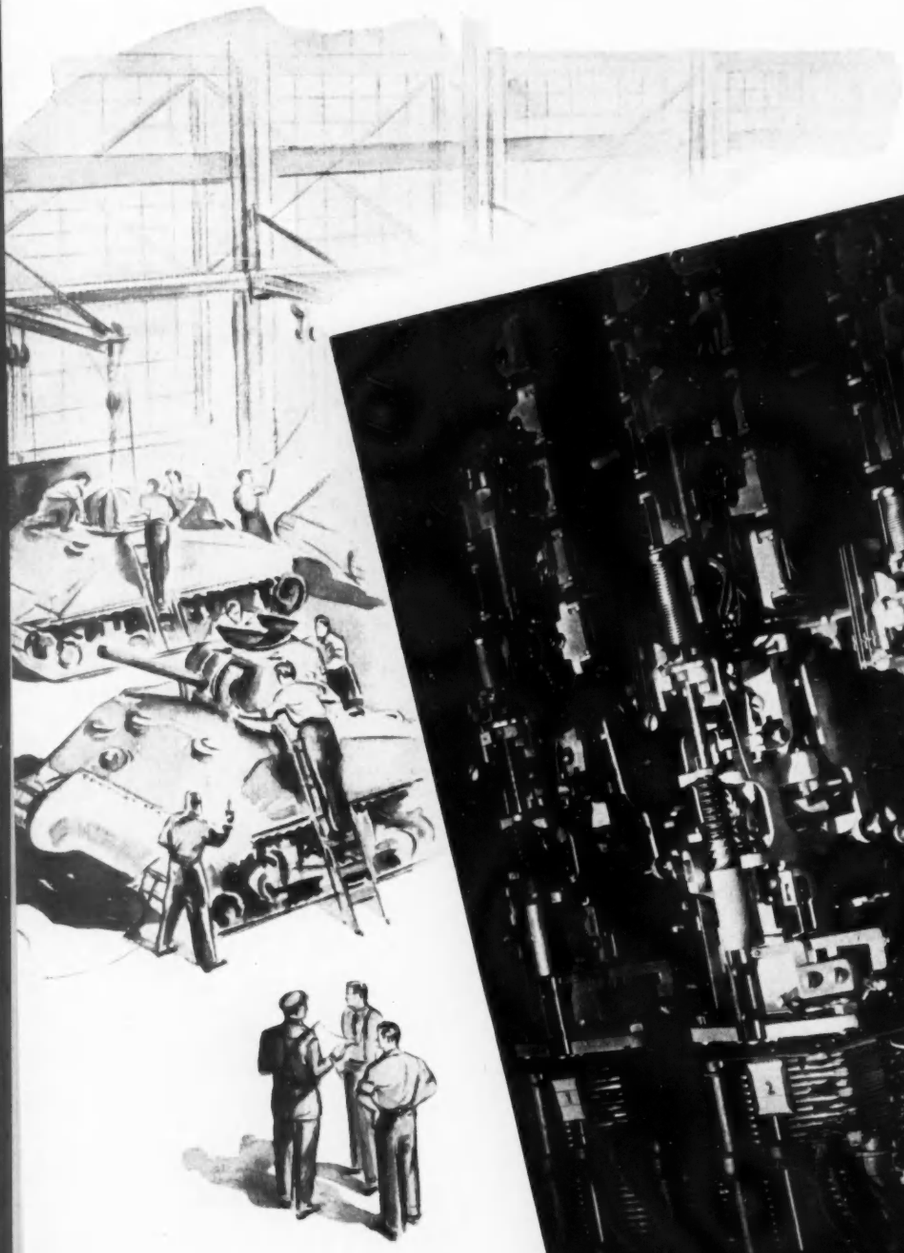
Awarded November 10, 1942
For Excellence In Body Production

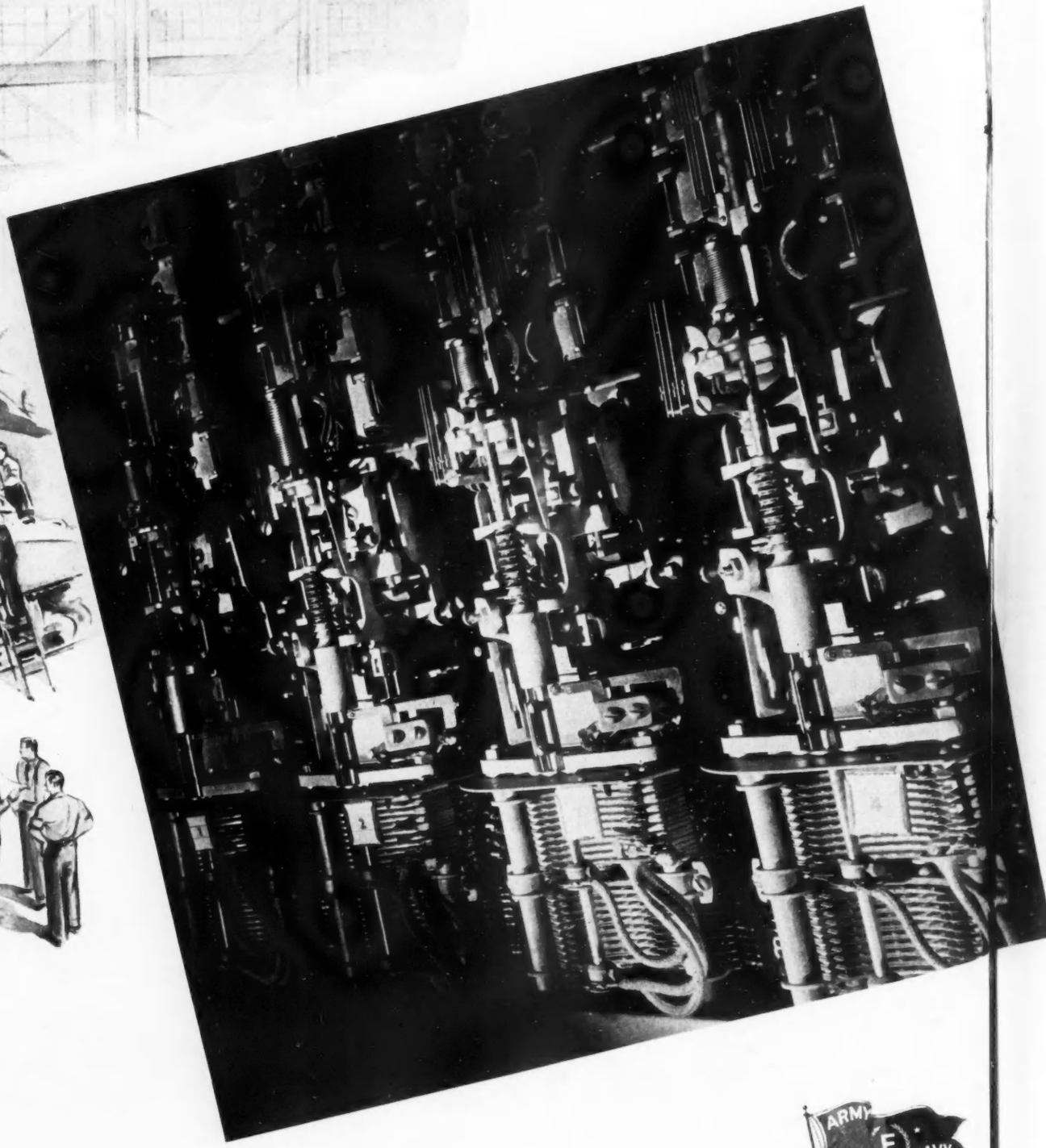
YORK-HOOVER BODY CORPORATION



EAST YORK, PENNSYLVANIA **BODY DIVISION**

Clicking O





The star for contin achieve-
ment has been ad to this
pennant for outstan roduc-
tion which flies ov Auto-
matic Electric plant

...ng Off PRODUCTIVE Seconds

for America at war!

The busy clicking of Strowger Automatic switches in telephone exchanges throughout the country means precious seconds saved for both telephone men and their war-busy customers.

Vital seconds they are, too, seconds which are being turned into productive time to further our tremendous war effort. For telephone users, Strowger equipment means faster connections, fewer errors and delays. For telephone men, it means minimum maintenance, and less manpower—and womanpower—needed.

Remember, too, that these savings are not merely "for the duration." For long years after the war, Strowger equipment will continue to yield its benefits to telephone users and telephone companies.

Today, this extra efficiency and extra dependability are especially vital, because, time saved now might well mean the difference between victory and defeat. That's why, despite the fact that our production is devoted almost wholly to communication equipment for war, we will still find time to help you keep *your* exchange operating at top efficiency. Let us know what problems you face, and we will do all we can to help you promptly and effectively—to the limit of our resources.

AUTOMATIC ELECTRIC

ORIGINATORS AND DEVELOPERS OF STROWGER STEP-BY-STEP MACHINE SWITCHING AUTOMATIC DIAL SYSTEMS

MAKERS OF TELEPHONE, SIGNALING AND COMMUNICATION APPARATUS
ELECTRICAL ENGINEERS, DESIGNERS AND CONSULTANTS

Distributors in U. S. and Possessions
AMERICAN AUTOMATIC ELECTRIC SALES COMPANY, Chicago, U.S.A.
Export Distributors: AUTOMATIC ELECTRIC SALES COMPANY, LIMITED

TOP OF THE RANGE

By ROBERT ERLE DILLON Sales Mgr.
W.C.Dillon & Company, Inc.
CHICAGO, ILLINOIS

A "How and Why" story on the necessity of correct tension measurement when stringing wire

***AUTHOR'S NOTE:** Acknowledgement is here given to Hammond Mathews, District Superintendent, Western Colorado Light and Power Company, in recognition of the unusual natural setting chosen for this unique line, the design and location details. Also to William Compton for carrying out the arduous job of construction.*

9,302 feet up in the heart of the treacherous Rocky Mountain Devil slide country there lies the obscure little village of Silverton. At its feet and almost perpendicularly the sheer walls of old Kendall and Sultan Mountains tower skyward, losing themselves in shifting, vapory mists.

This is a land of defiance, of courage, of men whose vision and determination have made it possible to bring out the buried riches of the Rockies!

Because temperatures often drop to 40° below zero and unexpected blizzards make snowshoes and skis an absolute necessity, line construction and maintenance in the Rockies is tougher, perhaps, than anywhere else in America.

This author has seen many unusual lines put up across rivers, lakes, and even down sheer cliffs, but in his opinion the almost superhuman accomplishment of placing more than five miles of wire in the air suspended at only 12 points on precipitous mountain ledges is truly an achievement to eclipse all others.

The Highland Mary Mine, rich lead, silver and zinc bearing property just outside of Silverton, depends upon electricity as the motive power for its huge bull mill, tram-way, and underground mining equipment. Situated at the far end of a winding valley, conductors have always traversed a circuitous route to reach the mine, at many points being directly in the pathway of Devil slide areas at the base of 13,000 foot King Solomon Mountain.

Poles have been stubbed and guyed in all directions, but they go down like straws when thousands of tons of snow and debris thunder across them. In those rare instances where the falling mass left the poles untouched, concussion snapped the conductors.

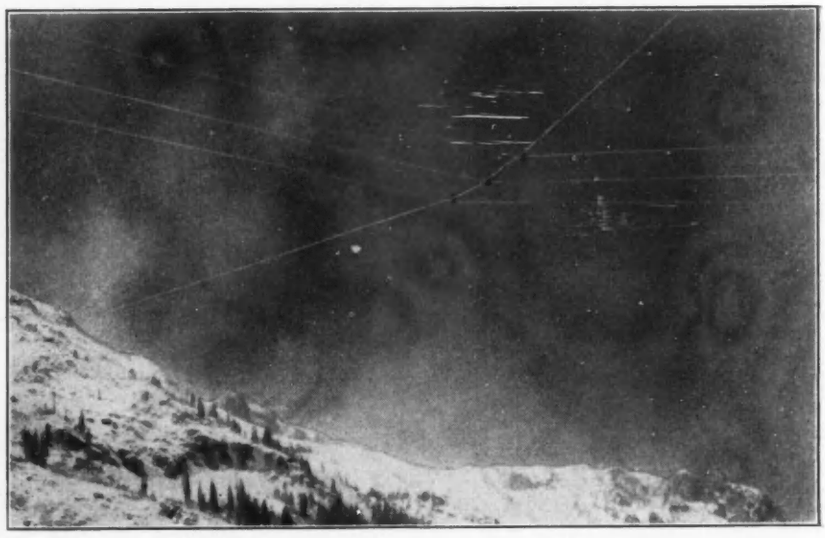
Hammond Mathews, left, veteran powerman, with the author.

It was estimated that installation of underground cable, to eliminate pole and wire breakage, would cost in the neighborhood of $25,000 not to mention the difficulties involved in transporting such material. Desirous of ending line "washouts" for once and for all, Joseph M. Bradley, president of the Highland Mary Mine, called in Frank Shafer to make a survey of the project.

From end to end of the valley a careful check was made. Measurements were taken and figures were computed. The final answer was an overhead line of colossal proportions—high above slides and danger of concussion.

At each end of the valley three poles were set up, one for dead-ending each conductor of the three phase lead. For the conductors, No. 4 BWG three wire galvanized steel was unreeled on the ground the full length of the valley. Cross spans of ⅜" seven strand galvanized steel were next reeled off at three carefully surveyed points. To separate cross span wires from conductors, Westinghouse insulators were used with a separational factor of approximately 24 inches.

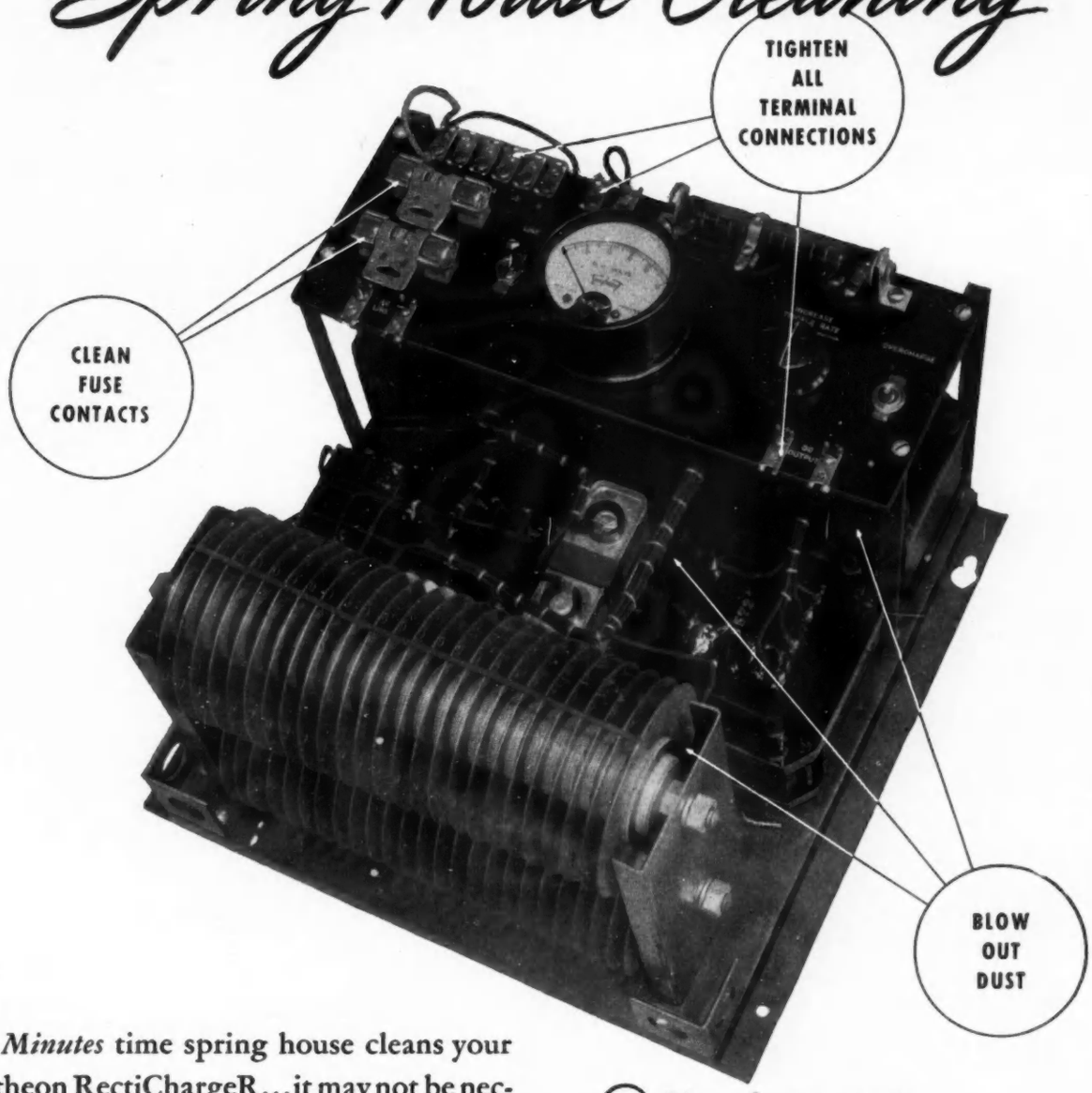
It has been remarked that few tasks equal the raising and moving of a house, but it can be quite safely said that even a house raising does not



High up where strong winds whip the shifting snow, Highland Mary spans anchor into the solid rock.

RAYTHEON RECTICHARGER

Spring House Cleaning



Ten Minutes time spring house cleans your Raytheon RectiChargeR... it may not be necessary... but it's helpful. Here's all you do:

1 Remove the cover.

(2) Tighten all terminal connections.

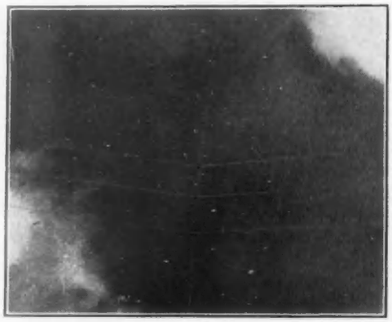
(3) Clean fuse contacts.

(4) Blow out dust.

5 Replace the cover and forget the RectiChargeR for another year.

NO MOVING PARTS Mean NO WEARING PARTS

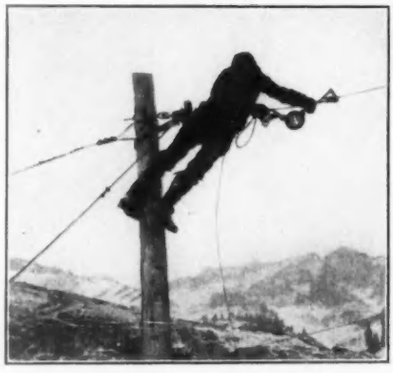
RAYTHEON MANUFACTURING COMPANY
190 WILLOW STREET, WALTHAM, MASS.



Giant spans 435 feet from canyon bottom support conductors over 6900 feet long.

require the concentrated effort of as many men at one point as was required in pulling the Highland Mary cross spans up the mountainside for anchoring. Eight husky Coloradans, wiry Bill Compton at their head, tugged and pulled each span, struggling to keep their footing on sharp rocks and avoid plummeting downward hundreds of feet.

Anchorage was made on the first cross span at a height of 360 feet above the valley floor. The span nearest the mine measured 275 feet from the ground, while the center span swayed in the air at 435 feet. Some



Dynamometer revealed tension variations up to 51% plus or minus.

idea of this incredible height may be gained by noting that the insulators, actually 10 inches in diameter, resembled nothing more than a small speck when suspended between the mountains. Anchorage was effected in solid rock for absolute permanency.

Since it was not possible to measure tension in the conductors by sight and sag, only an oscillation reading was made on the end conductors. All wires were pulled up with a three ton chain hoist until they "looked" right.

Upon completion of the line, designed to carry 16,500 volts, 60 cycle three-phase current, it was estimated that the first cross span contained 570 pounds of wire, the second and third spans each 585 pounds. The weight of the three conductors combined totaled

Lineman taking tension reading at end of 1759 foot span. Estimated tension was 1200 lbs. Dynamometer revealed only 450 lbs.

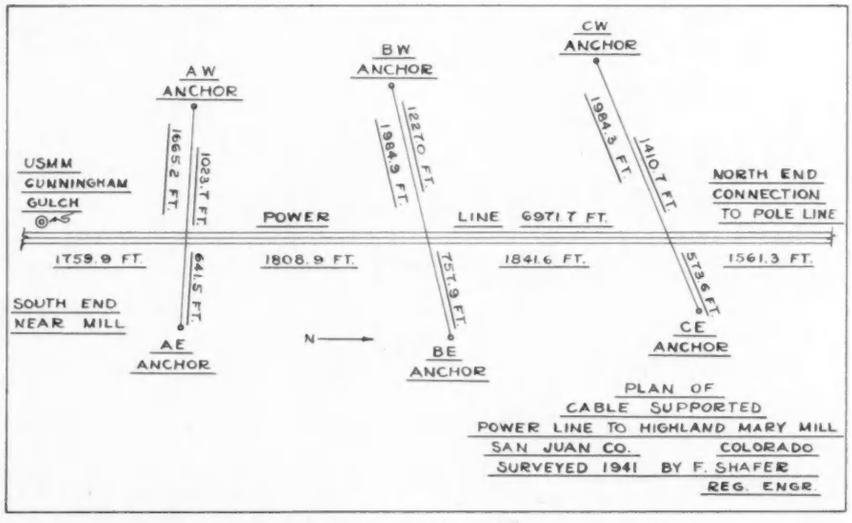
3245 pounds—a grand total weight of 4985 pounds!

Realizing the importance of placing the supporting spans and conductors at correct tension a 7,500 pound capacity Dillon Dynamometer was selected for the job. In so doing, test checks proved the undeniable need for an instrument of this kind. In one conductor where tension had been estimated by three veteran line-men at between 1,000 and 1,200 pounds, the Dynamometer indicated 450 pounds—an important difference of 750 pounds.

In other conductors checked, differences between estimated and actual tensions measured by the Dynamometer were as great as 51%. However, tensions were brought up to normal quickly by leaving the Dynamometer hooked into the line and pulling up with a portable hoist.

According to check tests, using a Dynamometer in placing wires at correct tension proved to be practical and sensible. In the West especially where canyons and sharp curves around rocky walls make sight and sag or oscillation methods out of the question, the Dynamometer is a necessity. Speaking from long experience, the author can say that it pays to be sure of tension in important wiring jobs, and the only positive way is through the use of such an instrument.

For the record this appears to have been especially true in the case of the Highland Mary since this line stands today—unique in its daring conception—strong in the engineering skill built into it. Dynamometer used on job was traction type with maximum hand.



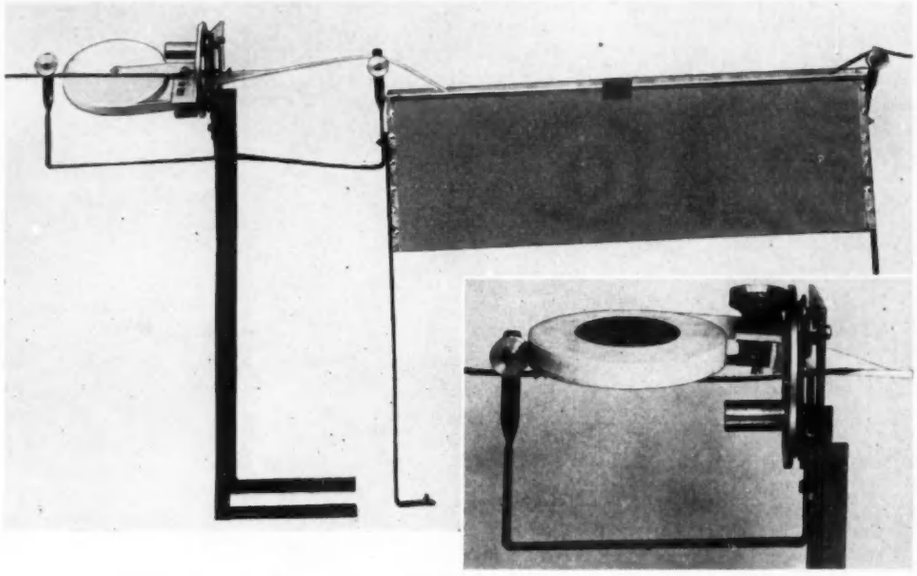
Actual surveyor's print of what is probably world's greatest high line.

NEW METHOD for RECOVERING WORN DROP WIRE
Costs less than 1c per foot . . .

RECOVERED in time SAVES the LINE

The "VICTORY" Drop Wire Wrapping machine fits squarely in line with the general conservation plan so necessary for a quick and complete winning of the war. As new materials become even more scarce, many companies are finding it helpful and very profitable to recover worn drops with the "VICTORY" Drop Wire Wrapping Machine.

Recovering Drop Wire in your Store Room



NEW STATIONARY MODEL—INSET: CLOSE-UP OF WRAPPING HEAD.

The NEW stationary model wraps covering of 1" muslin tape on both parallel and twisted Drop Wire with ¼" overlap. Recovered wire passes through tank of quick drying insulating paint which seals pores and provides new tough weather-proof protection.

Operating Instructions:

Note: Under present conditions it is advisable to remove and recover drops still in good condition before allowing them to deteriorate until 100% recovery is not possible.

1. **Remove worn drops for final inspection in store room.**
2. **Splice all wire (using staggered splice) on which rubber has not peeled or crystallized. Splice should be thinly taped with rubber tape only.**
3. **Coil all wire on drum preparatory to passing through Wrapping Machine.**
4. **Brake must be applied to drum to prevent slack in wire passing into machine. Wire must be under tension at all times.**
5. **Hand wrap for about 12 to 15 inches and pull through by hand for length of tank and submerge wire in tank by passing under removable rollers.**

The **COMPLETE UNIT Mounted Ready For INSTANT OPERATION**
$74.00 f.o.b. TOPEKA

1" Musling Tape in 300' Rolls
1 to 299 rolls—$1.72 each
300 to 599 rolls—$1.68 each
600 rolls or more
$1.62 each

Order Your **"VICTORY" Wrapping Machine** *Today*

FROM YOUR JOBBER OR FROM

Cable Spinning Equipment Co. TOPEKA, KANSAS

YOUR QUESTIONS ANSWERED FREE

Line AND Desk

Q. Can an ordinary public address amplifier be used in a telephone line for amplifying voice currents ?

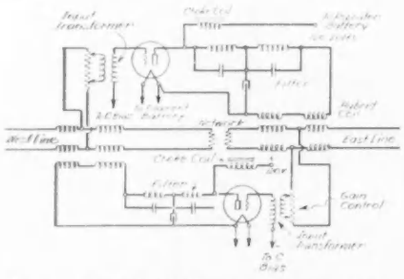


Fig. 1—Typical telephone repeater circuit.

A. An ordinary amplifier will of course amplify voice currents when placed in a telephone line but only in one direction. That is, it would not permit two way telephone conversation. A switching mechanism would need to be used whereby the input and output ends of the amplifier could be reversed so as to always amplify the talkers voice and having the output end towards the listener. In order to amplify by means of vacuum tubes the voice currents of a telephone line a device known as a **repeater** is required. This is in reality two one-way amplifiers connected in a Wheatstone Bridge transformer arrangement which by an ingenious balancing combination prevents the two one-way amplifiers from interfering with each other and thus pemits two way conversation through the amplifier. Fig. 1 illustrates the connections of a typical telephone receiver.

Q. Why does the reduction of side tone in the modern telephone set improve telephone transmission.

A. Transmission improvement in the modern side tone sets results from two factors. Namely, (1) reduction of the room noise picked up by the transmitter which eliminates the masking effect which would otherwise result. (2) The talker instinctively speaks louder with reduced side tone and this results in a considerable transmission gain.

Anti-side tone sets of modern design offer a real solution to telephone transmission difficulties in noisy locations but will provide an improvement in any location as a result of the increased outgoing volume transmission.

Q. Are repeaters required on carrier telephone circuits?

A. Yes, special carrier repeaters must be used on long haul carrier telephone circuits. Short haul circuits operate without repeaters.

Q. What are the recognized overall standards for exchange transmission at the present time?

A. The transmission standards are as follows:

Type of Connection	Overall Loss
Between business areas	16—18 db
Between business and residential areas	17—19 db
Between residential areas	18—20 db
Between tandem connections	20—22 db

Q. What is the difference between the action of telephones and power transpositions in reducing the inductive interference in the telephone circuit?

A. Telephone transpositions merely equalize the voltage induced on the two wires of the telephone circuit. If transpositions are not used the induced power voltage will be higher on the wire nearest the power line. Inasmuch as the voltage is induced in both wires the differential between the voltages on the two wires is of the same polarity would be effective in setting up circulating noise currents. The placing of transposition at periodic points along the line results in an **equalization in the potential** induced in both wires. Power transpositions on the other hand, tend to **neutralize the voltages** induced on the several wires of the telephone circuit thus reducing the noise tendency. Power transpositions, however, are effective only for balanced currents and voltages and inasmuch as in many types of power lines the chief source of noise is the unbalanced current inherent to the type of line the power transpositions serve little purpose.

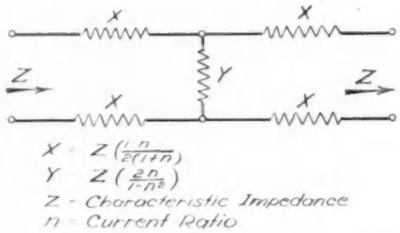


Fig. 1—Formula for computing transmission loss pads.

Q. We would like to know the formula for determining the resistance in series and shunt elements in a balanced H type transmission loss path.

A. The equations for computing values of the series and shunt elements of an H type path are shown in the following illustration. To illustrate the use of this formula, assume we wish to design a 10 db path referring to a current ratio versus decibel table we find that 10 decibels corresponds to the current ratio of 0.3162. Substituting in our formula we get:

$$X = 600\left(\frac{1-0.3162}{2\ (1+0.3162}\right) = 155^{w}$$

$$Y = 600\left(\frac{2 \times 0.3162}{1-0.3162^2}\right) = 420^{w}$$

Q. What insulation standards should be maintained on toll and exchange lines?

A. Normally **25 megohms per mile** is the standard for toll lines and 500,000 ohms or one-half megohm as a minmum leakage resistance for the average farm line.

Questions Answered FREE

We welcome questions from every reader. If quick direct mail reply is needed please enclose stamped addressed envelope.

Exemption Issued On CMP Regulation

Telephone companies have been exempted from the 60-day inventory restrictions of Controlled Materials Plan Regulation No. 2, and will be subject to the restrictions which have been imposed on inventories in Utilities Order U-3, it was announced April 1. U-3 is the newly issued order applicable to communications.

The exemption from CMP Regulation No. 2 contained in Inventory Direction No. 1, applies to "operators" in communications field to the extent that they are engaged in rendering telephone communication service (and such telephone and teletype service as may also be conducted by them) within, to, or from the United States, its territories, or possessions.

WAR PRODUCTION BOARD

Part 3175—Regulations Applicable To The Controlled Materials Plan

(Inventory Direction 1 under CMP Regulation 2)

COMMUNICATIONS

§ **3175.101 Inventory Direction No. 1.** Pursuant to paragraph (b) (2) of CMP Regulation 2, **It is hearby ordered,** That:

In the case of any "operator" as defined in and who is subject to the provisions of Utilities Order U-3, as amended from time to time the provisions of paragraph (b) (1) of CMP Regulation 2 shall not apply and, in lieu thereof, such operatior shall be subject to the inventory limitations contained in Utilities Order U-3. All other provisions of CMP Regulation 2 shall remain applicable to such operator except that appeals under paragraph (j) and communications under paragraph (k) (2) shall be addressed to War Production Board, Communications Division, Washington, D.C.

Issued this 1st day of April 1943.

War Poduction Board,
By J. Joseph Whelan,
Recording Secretary.

Washington Companies Merge

According to newspaper reports the Wenas (Wash.) Telephone Company will become a part of the Selah (Wash.) Telephone Company after legal matters have been attended to. The agreement was reached during the meeting of the Wenas company in early February. Charles Cowan has served as manager of the Wenas company for the past few years. Altho the latter company was organized before the Selah company for many years it maintained its own switchboard. Several years ago, because of a ruling on telephone areas, switching was conducted through the Yakima exchange. The burden of management expense was the major factor in the decision of the Wenas company to merge with the Selah company.

New High In New York Stations

A new high total of 1,815,277 telephones in New York City was reached during the week ended February 21, according to the New York Telephone Company. The previous peak of 1,812,587, reached in January, 1930, was thus overtaken and passed after thirteen years.

From this previous peak the number of telephones in the city had declined by nearly 345,000 to a low of 1,467,842 in August, 1935. Last year about 26,250 telephones were added in the city, and approximately 60,000 were added in 1941.

Phones Direct Trains

Telephones are now used for the transmission of train orders over nearly 150,000 miles of railroad while the telegraph is used on 83,000 miles.

RAYTHEON RectiChargeRs

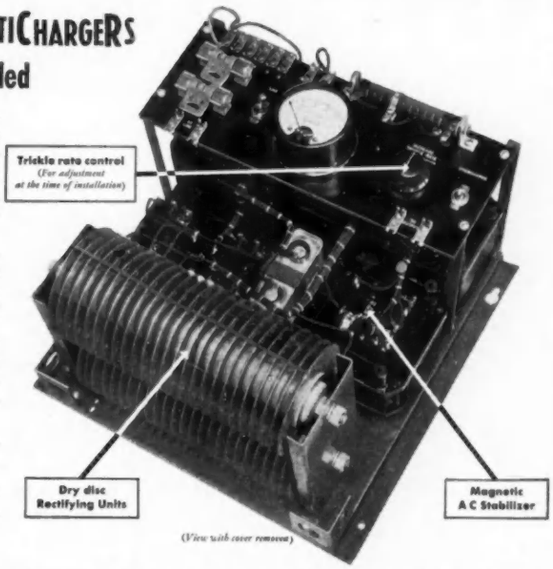
Operate Unattended

Plug 'em in — go away and forget 'em. What a pleasure it is to use a battery charger without moving or expendable parts. Nothing that requires frequent adjustment.

The design of the Raytheon **RectiChargeR** enables its output to follow the load and assume full responsibility for keeping your storage batteries fully charged, neither burning them up by overcharging nor starving them by undercharging.

Battery life may be increased as much as 40%.

Operating difficulties caused by under and over voltage are automatically eliminated.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(For adjustment at the time of installation)
Dry disc Rectifying Units
Magnetic A C Stabilizer
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GUY TONGS

for making unsafe poles safe for men to work on

Kearney Guy Tongs appeal to safety-minded operating men. They provide a safe and convenient means of guying a pole, high enough above the ground to prevent the pole from going over when a lineman's weight is added. This tong is handily installed with a pike pole—hinged to open and close around the pole, and securely held by steel teeth. With guys in place, pole is securely held by three separate guys.

Place your order now. Use this item to safely wreck and salvage lines and other important jobs.

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TELEPHONE ACCESSORIES

LETTERS

from TELEPHONE ENGINEER readers

Dear Mr. Smith:

This refers to Mr. Ure's letter published in the July issue of Fortnightly TELEPHONE ENGINEER. The following is my answer to Mr. Ure. You are, of course, at liberty to use any of this information or drawings.

W. Chunn,
Telephone Engineer,
Missouri Pacific Lines,
St. Louis.

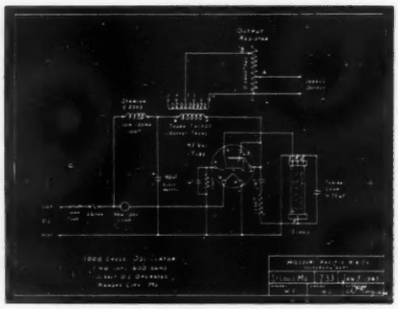
Dear Sir:

In the July issue of "Fortnightly TELEPHONE ENGINEER" I saw your letter to the Editor asking for design of a 1000 cycle oscillator.

At about that time I was engaged in some experimental work on a telegraph carrier system and had evolved a vacuum tube oscillator that was quite satisfactory on higher frequencies, 4 to 6 KC. So thinking we might have need for it sometime, I set up and tried out the 1000 cycle oscillator shown in attached Drawing 732.

It makes use of a Western Electric No. 13 induction coil, this is a local battery induction coil, for oscillating coil. I also tried a Kellogg 28-C but found the W. E. coil far superior for this purpose. The oscillating tube is a 43, and a 25Z5 is used as a half-wave rectifier to supply the B-battery. The two 25 volt heaters are connected in series, in series with a 40 watt, 120 volt lamp to the 110 volt circuit, without transformer, which gives proper heater current. This is much the same principle as the universal a-c, d-c radio set, the lamp taking the place of the usual resistance in the cord, and this oscillator should operate on d-c also if properly poled, the positive side to the plate circuit. I tried it on d-c and it worked all right except the output was less on d-c. I think this can be corrected, if one wants a universal a-c, d-c set, by changing the size of the two filter condensers, increasing the 4 mf and decreasing the 75 mf until the output voltage of the rectifier is the same on either a-c or d-c. This 75 mf condenser was no doubt much larger than necessary but I happened to have it available. Would suggest probably a 20 mf on the 25Z5 side and a 20 or 40 mf on the load side. These can be dry electrolytic, unipolar type.

The 5W retardation coil, in the filter circuit, is a Western Electric coil designed for a composite balancing set coil in a telegraph duplex set. I happened to have it on hand. It has 153 ohms d-c resistance and measured 6.3 henrys and 400 ohms effective a-c resistance at 60



cycles. There is no question but that it could be replaced by most any radio-set type filter choke, such as Stancor C-2303, as was done in the d-c circuit shown on attached Drawing 733. The 77-A repeating coil is a Western Electric. If you do not have this coil available, or a 1:1 ratio repeating coil of any other manufacturer, this could no doubt be replaced with a tube to 500 ohm line radio-type audio frequency output transformer such as a Thordarson T-61S25.

The first thing to do in setting up this oscillator is to adjust the frequency. The frequency is determined by the capacity of the tuning condenser; the resonant frequency of this capacity and the inductance of the primary of the 13 induction coil. While for my set up in Drawing 732, I got 6 mf, in a subsequent set up, Drawing 733, using a different induction coil, I got 4.75 mf, so the inductance of various induction coils no doubt vary.

To set the frequency beat the output of the oscillator against a 1000 cycle source. You may have another 1000 cycle oscillator available or may be able to get a 1000 cycle test oscillator over a long distance line from some nearby Bell office. Connect output of this oscillator direct to the test oscillator or long distance line and listen across the combination with a receiver. Vary the tuning condenser until beats, or pulses, appear and until they slow down to as slow a rate as you can get, say five per second or less. Five per second would show the two frequencies were only five cycles apart.

Once the frequency is adjusted it will not be changed by subsequent output adjustments. The output of this oscillator is considerably more than one mili-watt so the purpose of the adjustable 0-5000 ohm adjustable slider type resistance, is to reduce this output. The resistance values shown in Drawing 732 are what I got for my test set up and may be used for a starting point, but if you want this oscillator for precise transmission measuring work, the output adjustment should be redetermined.

For transmission measuring work, the oscillator besides having one mili-watt output into 600 ohms, should have an internal impedance of 600 ohms. This can be accomplished with the 0-5000

Governor Bricker To Address Ohio Convention

The program of the Ohio Independent Telephone Association Convention at Columbus scheduled for April 27 and 28 had been completed according to advance notice from secretary-treasurer Frank L. McKinney. Included as a speaker is Governor John W. Bricker, mentioned by many as a possible Republican candidate for president.

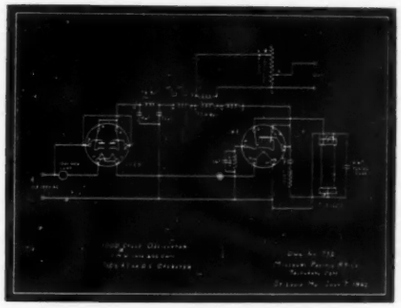
In addition to Governor Bricker the convention will hear J. Warren Safford, association president Lieut. Col. Gustav Hirsch, Mr. McKinney, Clyde S. Bailey, Randolph Eide, president of the Ohio Bell, Colonel Wm. C. Henry, Leighton H. Peebles, Loren M. Berry and several out-of-the-industry speakers on selected subjects.

The Ohio convention is one of the larger state association meetings and is usually very well attended. The many war problems will be fully discussed and we urge everyone in that section to attend the two-day convention.

ohm output resistor shown having two adjustable sliders at A and B assuming that you have a Western Electric 12-A measuring set or other like set reading to 15 or 20 db loss and a 10 db, 600 ohm impedance pad or attenuator.

Connect the output of the oscillator thru 10 db pad to measuring set and adjust B slider until set reads 10 db loss. Now bridge a 600 ohm non-inductive resistance across the pair between oscillator and pad. If A is set in the right place it should produce an additional loss of 3.6 db, making the total 13.6. It should also produce the same loss (3.6 db) when bridged on the pair between the pad and the measuring set. If the 600 ohm resistance produces more than 3.6 db loss on the oscillator side, it shows the impedance of the oscillator is too high; move A toward C. Vice-versa if it produces less than 3.6 db move A away from C. Then take the bridged resistance off and readjust B until the set again reads 10 loss. Then put the bridge back on and try again. The final adjustment is where with no bridging resistance the meter reads -10, and with the 600 ohm resistance bridged on either side of the pad, it measures the same value, -13.6 db.

Shortly after making this experiment, we installed a Type H carrier telephone terminal in our Kansas City office which



is in the d-c area and had only d-c power available. We successfully modified the carrier terminal to operate on the 110/220 volt d-c supply, that is beside the point, but we needed a 1000 cycle oscillator for initial line up and subsequent maintenance. We could not use the W. E. Co. KS-5472 1000 cycle machine, which we had used at other locations because this machine requires 60 cycle a-c.

Accordingly I made the oscillator shown in Drawing 733, permanently installed it in the carrier bay. As when using d-c, the rectifier tube is useless. I did not put in any 25Z5. Because of its balasting action the 40 watt lamp seems as good for one 25 volt tube as two in series; the 40 watt lamp was still found to be

A WAR-TIME WARNING TO TELEPHONE PLANT OPERATORS

THE length of life . . . and the amount of profit . . . of a telephone plant operation . . . is in direct ratio to the quality of the service rendered to the talking public.

Satisfactory service can only be given when the lines and all equipment are free of faults. One should not wait until trouble actually impairs . . . or stops . . . service.

The wise Telephone Plant Operator foretells coming troubles promptly and accurately before they become serious, by regular and systematic tests.

Submit your testing and fault finding problems to Shallcross . . . there is a Shallcross instrument to answer your problem . . . and to fit your budget.

True, much of Shallcross facilities are applied to Victory effort . . . perhaps ***today*** your needs may be taken care of, but ***hurry!*** . . . perhaps ***tomorrow*** you will have to wait.

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STRONGER—Average life 1,500 hours of high brilliancy. Strong breakage resistant filament. Tight, correctly formed bases.

Available in: CLEAR
NATURAL RUBY*
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**While present supply lasts*

SYLVANIA
ELECTRIC PRODUCTS INC.
SALEM, MASS.
Formerly Hygrade Sylvania Corporation

the best value for proper heater current. The filter is still necessary because commercial d-c power is not quiet like a battery, it has plenty of ripple on it.

In this design I used radio-type filter choke and output transformer, more or less to see if they would work. I made the frequency adjustment beating it with the Telephone Company's test oscillator in their central office serving this area, over a PBX central office trunk. This oscillator has been installed about six months and now we have had some field experience with it and I would say its performance has been equal to a W. E. Co. KS-5472. It cost about $10 or $12 versus $60 to $80 for the KS-5472.

If you are not familiar with attenuator pads of specific impedance and loss and want to build one, I shall be glad to send you the values for a 10 db, 600 ohm, or the general formula for any loss pad any impedance.

I shall be interested to hear from you if this oscillator meets your requirements. Being that I did not quite complete the design for the a-c application, some of your experience and design figures may be of value to me in case I want to build one for a-c operation.

Yours very truly,

W. Chunn,

Telephone Engineer.

(Ed. Note) Mr. Chum adds this postscript to his letter. "P.S. I forgot to mention, the 13 induction coil having an air-return magnetic current, must not be mounted near any iron objects, at least MUST NOT be mounted on a steel mounting plate else its inductance be changed considerably. Even iron mounting screws make some difference, brass screws are preferable. I used a panel of beaver-board.—W.C."

Let us remodel those old timers!

Though new private telephones are out, due to the war, the public's need for service grows. You can meet this need, and patriotically, by installing Gray Telephone Pay Stations in small population centers. Send us your outmoded telephones. You can extend us the priorities necessary to convert them into active, profitable pay stations without sacrifice of critical materials. Let us help you to help Uncle Sam!

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Highlights of the Communications News

(Continued from page 27)

munications experience to his post when he became Director of Naval Communications last September 15. As Fleet Communications Officer from January, 1942 to September, 1942 for Admiral Ernest J. King, Commander-in-Chief, Captain Holden has an invaluable knowledge of sea radio operations and communication problems.

One of Captain Holden's outstanding contributions as Director was the reorganization last November of the entire Office of Naval Communications. Designed to streamline operations more effectively in wartime, the reorganization was made necessary by the tremendously increased load of communications occasioned by the operation of naval and merchant vessels on the seven seas and the establishment of bases in the most remote corners of the earth. It brought more efficient functioning of the entire Navy communications setup.

Warren Leaves NARUC

THE National Association of Railroad and Utilities Commissioners lost its Assistant General Solicitor, Frank B. Warren, April 1, when he became the General Counsel of RCA Communications. Warren, one of the most widely experienced men in the communications industry with an outstanding record of achievement in the utilities field has served with the NARUC as Assistant Solicitor for the past year. Prior to that time he was a member of the FCC's legal staff from June 1937 to March 16, 1942 when he joined the NARUC. Some of the important telephone proceedings in which he was a leading figure were the recent telephone separation study which led to the simplification of that procedure in 1942; the inquiry into the trans-oceanic radiotelephone licenses in 1937-38; the negotiations in the 1941 Bell System toll rate reduction of $14,000,000. He was also the Commission attorney in the Pacific Telephone & Telegraph toll rate inquiry.

1.5-Billion Postwar Bell Financing Seen

The greatest financing program in corporate history was forecast March 20 by two Bell Telephone officials who predicted that the system may have to raise as much as $1,500,000,000 during the first post-war decade to finance the development and reconstruction of its communication facilities.

Charles P. Cooper, financial vice-president of American Telephone & Telegraph Co., and Mark R. Sullivan, operating vice-president, said in the current issue of the Bell Telephone Magazine that the system may have to build one third as much new plant in the first 10 years after the war as it did during its entire 65 years of growth to date.

To carry out this gigantic program, Cooper said, the Bell System will have to raise "several hundred million dollars" in each of the first few years after the war during which materials again become available.

WLB Takes Jurisdiction Over Disputing Salesmen

Even though it involved 100 salesmen who solicit advertising for classified telephone directories published in New York City and three New York counties of Nassau, Suffolk and Westchester, the War Labor Board March 30 announced that it intended to take jurisdiction of all labor disputes, even though not in the war effort, not settled by peaceful procedures. The Board took the jurisdiction in this case which involved these salesmen of the Reuben H. Donnelley Corporation who are members of the CIO United Professional Office Wokers union.

In a rather curious line of reasoning, WLB Member Wayne L. Morse stated that the Board felt it had to take jurisdiction in this case as in all similar disputes in "the best interests of the national security and of the total war effort." The dispute has been in controversy since last November when the company and the union failed to agree on a bargaining contract.

Fewer Jokers Use Phone

Chicago—April 2—

April fool jokes requiring the use of telephone lines reached the lowest point in 20 years yesterday, it was reported by a spokesman for the Illinois Bell Telephone company. He said that the drop in prankster's calls is due chiefly to civilians' wish to aid war communications by releasing the wires for calls important to the prosecution of the war. Robert Bean, assistant director of Brookfield zoo, said that, altho the zoo yesterday received several hundred calls for "Mr. Fox," "Mr. Wolf," and other fictitious names, there was a 50 per cent drop in calls from April fools' funny men. Similar drops in that type of calls were noted at Lincoln park and the County morgue.

Rescind Merger Action

At a special meeting of the Denair (Calif.) Telephone Association held last month members voted to rescind action taken at the annual meeting which approved consolidation with the Farmers Union Telephone Company of Hilmar, Calif.

Van Duzer Named By Ohio Bell

Appointment of Ashley M. Van Duzer, Cleveland attorney, to the position of general solicitor of The Ohio Bell Telephone Company, was announced last fortnight by Randolph Eide, the company's president.

Mr. Van Duzer is a partner in the law firm of McKeehan, Arter, Stewart and Cottrell, in the Terminal Tower, with which firm he has been associated in the practice of law for 27 years. He will remain a partner in the firm. Karl E. Burr, of Columbus, will continue as Ohio Bell general counsel.

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YOU CANNOT BUY BETTER CROSS-ARMS
Than Those Which Bear the
American Cross-Arm, Inc. Trade-Mark

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- THEY ARE FROM THE BEST GRADE OF WASHINGTON FIR
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- THEY ARE RIGHT IN ALL WAYS

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BARTLETT Tree Paint

An Aid to Good Public Relations

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$1.50 1-Gal. Can
$6.50 5-Gal. in Wood Pails

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No. 114B—26 in. Special Utility Saw

Big, husky streamlined teeth make this the fastest cutting saw we have ever offered; yet cuts are clean, and the operator finds it easy to use and easy to recondition. No difficult filing problem.

No. 777-26" Two Hand Pruner. Rugged, drop forged blade and hook of hardened tool steel fitted with 26 in. white ash handles and steel ferrules make this a light weight, rapid cutting tool of exceptional durability. Strap ferrules 10 in. long, if desired.

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Text of WPB Utilities Order U-3

(Continued from page 32)

orders, and under all provisions of Utilities Order U-2 and U-3, to place this delivery order, to receive the item(s) ordered for the purpose for which ordered and to use any preference rating or allotment number or symbol which the undersigned has placed on this order.

Such certification shall in every case be signed manually or as provided in Priorities Regulation No. 7.

(c) **Restrictions on use of ratings and allotment symbol.** (1) In addition to the limitations in paragraph (c) (2) and (c) (5) below, the preference ratings assigned and/or the allotment symbol authorized by this order shall not be applied by an operator:

(i) To obtain deliveries of materials containing copper, iron, steel, or nickel where such metals could be eliminated therefrom by the substitution of less scarce metals without serious loss of efficiency.

(ii) To obtain materials for exchange plant of any kind (exclusive of telegraph and/or teletypewriter plant) or for toll telephone central office equipment or for combined exchange and toll telephone central office equipment where the cost of such material to which the rating and/or allotment symbol is applied, in any single case, exceeds $2,500 or the total cost of material (both new and reused) in a single case exceeds $5,000, or to obtain PBX switchboards required to serve subscribers other than those set forth in paragraphs (e) (1) (i) and (e) (1) (ii) of Utilities Order U-2.

(iii) To obtain material for toll line plant where the cost of material (both new and reused) in any single case exceeds $500.

(iv) To obtain material for teletypewriters where the cost of material (both new and reused) in any single case exceeds $500 or to obtain teletypewriters to meet other than the minimum needs for service of the kind included in paragraph (e) (1) (i) of Utilities Order U-2.

(v) To obtain material for telegraph and/or teletypewriter plant, other than teletypewriters, where the cost of material (both new and reused) in any single case exceeds $2,500.

(2) No operator shall apply the ratings assigned by this order to obtain material for repairs to buildings except in accordance with, and to the extent authorized by Order L-41.

(3) The foregoing dollar limitations in paragraphs (c) (1) (ii), (c) (1) (iii) and (c) (1) (iv) shall not apply to the portions of the material or equipment obtained from the operator's inventory or plant to meet temporary traffic or emergency requirements other than those occasioned by regularly recurring seasonal or holiday requirements. Any material or equipment so employed to meet such requirements shall, upon the termination of such temporary traffic or emergency requirements, be restored to the location in plant from which it was taken, if the service requirements at that time justify, or placed in inventory. In case the requirements for use of any such material or equipment extends in any single instance beyond a period of thirty (30) days, the operator shall on or before the thirtieth day of such use make application to the Office of War Utilities on Form PD-716 for authorization to continue the use of such material or equipment setting forth in detail the appropriate information requested on said form, and in addition thereto, such other information as may, from time to time, be required.

(4) Excepted from the foregoing provisions of paragraphs (c) (1) (ii), (c) (1) (iii) and (c) (1) (iv) are maintenance and repair materials and materials authorized on Form PD-685 under the provision of paragraph (b) (1) (ii).

(5) No operator shall subdivide a single order, job, or project to qualify the same under the terms of this order.

(d) **Sales of materials from operator's excess stock.** An operator may sell to any other operator material from his stocks only where a preference rating assigned by this order, or a preference rating certificate, order or other direction issued by the Director General for Operations of the War Production Board or the War Production Board is extended by the operator purchasing such material to the operator selling such material. Any such sale made in conformity with the terms of this paragraph shall be deemed to be expressly permitted within the terms of paragraph (c) (3) of Priorities Regulation No. 13.

(e) **Restrictions on deliveries, inventory and use.** (1) Except as provided in paragraph (f) below, no operator who has applied any rating assigned or the allotment symbol authorized by this order shall at any time accept deliveries of material (whether or not rated pursuant to this order) to be used for any purpose:

(i) Until the dollar value of the operator's inventory of material shall have been reduced to a practical working minimum. Such practical working mimimum shall in no event exceed 27½% of the dollar value of material used for all purposes during the calendar year 1940 exclusive of poles; crossarms; insulators; non-metallic conduit; furniture and office equipment; printing, stationery and office supplies; house service supplies; and coal and petroleum products.

(ii) If the receipt thereof would increase the dollar value of the operator's inventory of material to an amount in excess of normal requirements which in no event shall exceed 27½% of the dollar value of material used for all purposes during the calendar year 1940 exclusive of poles; crossarms; insulators; non-metallic conduit; furniture and office equipment; printing, stationery and office supplies; house service supplies; and coal and petroleum products.

(iii) If the receipt thereof would increase the operator's inventory of a specific size, type and gauge of cable, wire or strand in excess of the estimated use of that specific size, type and gauge for the next 60 days: **Provided, however,** That this restriction shall not apply to that portion of a minimum standard reel of cable or strand which is in excess of the estimated use for the next 60 days nor where the lengths of cable in inventory are not such as will meet the requirements of a project for which cable is needed.

(2) No operator shall use the allotment symbol or preference ratings assigned to obtain maintenance, repair or operating supplies during any calendar quarter in an aggregate dollar amount exceeding one-fourth of his aggregate dollar usage for maintenance, repair and operating supplies during the calendar year 1942 except that an operator to meet seasonal conditions may use such allotment symbol or preference ratings to obtain

during any calandar quarter, up to, but not in excess of, his aggregate dollar usage for maintenance, repair and operating supplies during the corresponding quarter of 1942. In no event, however, shall any operator use such allotment symbol or preference ratings to obtain maintenance, repair and operating supplies during the 12 months ending March 31, 1944, in an amount exceeding his aggregate dollar usage for maintenance, repair and operating supplies during the calendar year 1942.

(f) **Exemptions.** (1) Any operator whose average value of inventory of material for the five calendar years prior to January 1, 1942, did not exceed $10,000, shall be exempt from the provisions of paragraphs (e) (1) (i) and (e) (1) (ii).

(2) Any operator whose use of materials during the year 1942 did not exceed $10,000, shall be exempt from the provisions of paragraph (e) (2) above.

(3) Material delivered pursuant to paragraph (b) (1) (ii) shall be exempt from the provisions of paragraph (e) above.

(4) From time to time, the War Production Board may determine that certain operators are exempt in whole or in part from the restrictions contained in paragraph (e) above.

(g) **Records and reports.** Each operator acquiring maintenance, repair or operating supplies pursuant to this regulation shall keep and preserve for a period of not less than two years, accurate and complete records of all such supplies so acquired and used, which shall, upon request be submitted to audit and inspection by duly authorized representatives of the War Production Board. In addition, each operator affected by this order shall file such reports with the Office of War Utilities as may from time to time be required by the War Production Board.

(h) **Applicability of regulations.** (1) This order and all transactions affected hereby, except as herein otherwise provided, are subject to all applicable regulations of the War Production Board, as amended from time to time.

(2) None of the provisions of CMP Regulation No. 5 shall apply to operators as defined in paragraph (a) (1) of this order, and no such operator shall obtain any material under the provisions of that Regulation.

(i) **Violations.** Any person who wilfully violates any provision of this order or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any department or agency of the United States is guilty of a crime, and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using material under priority control, and may be deprived of priorities assistance.

(j) **Communications.** All reports to be filed, appeals and other communications concerning this order should be addressed to: Office of War Utilities, War Production Board, Washington, D. C. Ref: U-3.

(k) All official actions taken pursuant to Preference Rating Order P-130, prior to April 1, 1943 in the name of the Director General for Operations or the Director, Office of War Utilities, are hereby ratified.

(P.D. Reg. 1, as amended, 6 F.R. 6680; W.P.B. Reg. 1, 7 F.R. 561; E.O. 9024, 7 F.R. 329; E.O. 9040, 7 F.R. 527; E.O. 9125, 7 F.R. 2719; sec. 2 (a), Pub. Law 671, 76th Cong., as amended by Pub. Laws 89 and 507, 77th Cong.)

Issued this 1st day of April 1943.

WAR PRODUCTION BOARD,
By J. Joseph Whalen,
Recording Secretary.

Schedule A

1. "Strapping" as defined in Order M-261, on fabricated containers (in knock-down or set-up forms, whether assembled or unassembled), required for packaging products to be shipped or

Long Life Telephone DRY CELLS

"Eveready"
"Columbia"
"Gray Label"

Developed in America's largest dry battery laboratory, this Cell is designed to give both ***longer life*** and ***higher sustained voltage.***

Engineered to one standard of superior quality by specialists in battery manufacture.

Made by the makers of "Eveready" "Air Cell" Operators' Transmitter Batteries.

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Put These Money-Savers On All Your Lines

HEMINGRAYS don't tax your operating budget. They actually save money because they outlive poles, hardware and crossarms; "keep up their money-saving efforts for 50 years"—one prominent utility reports.

A SECRET glass "batch-mix"—climax of 87 years of experience—plus Owens-Illinois quality-controlled production, results in Hemingrays free of voids, stresses and strains . . . so homogeneous that sudden changes of temperature leave them unimpaired to work perfectly through sun, rain, hail, snow and sleet.

3 FAVORITES ON RURAL LINES—Sturdy, all-purpose Hemingray Number 16. Hemingray Number 42, with its long leakage path keeping "toll" lines trouble free. Number 9 (illustr.), with its drip point petticoat for fast moisture runoff. Get samples.

LOW IN COST and long in service-life...sold only by principal jobbers

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Are You
Trying to Operate

Short Handed?

If so, it will pay to check up on Suttle's Printing Service to Telephone men.

Well planned accounting forms help speed up detail work.

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Our knowledge of your problems and our experience in making all kinds of telephone printed forms will save you lots of time and trouble.

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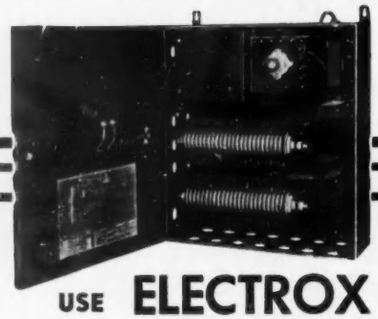

USE ELECTROX RECTIFIERS to Replace Your Batteries

- **Supplies DC power for all types of telephone equipment.**

BATTERY ELIMINATORS — with or without power-off relays for magneto operators' sets.

BATTERY ELIMINATORS—with constant voltage output for PAX and PBX, with or without sub-cycle ringer.

BATTERY CHARGERS — for trickle charging telephone batteries.

AUTOMATIC BATTERY CHARGERS — for exchange batteries.

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delivered.

2. Fuel or electric power.

3. Office machinery or office equipment.

4. Clothing, shoes or other wearing apparel, if made of leather or textiles, except that the following types may be included in operating supplies when specifically designed and used to furnish protection against specific occupational hazards, (other than weather):

a. Asbestos clothing.

b. Safety clothing impregnated or coated for the purpose of making the same resistant against fire, acids, other chemicals or abrasives.

c. Safety industrial rubber gloves and hoods and lineman's rubber gloves and sleeves.

d. Gauntlet type welders' leather gloves and mittens, and electricians' leather protector or cover gloves.

e. Other safety leather gloves or mittens, but only if steel stitched or steel reinforced.

f. Safety industrial leather clothing other than gloves or mittens.

g. Metal mesh gloves, aprons and sleeves.

h. Plastic and fibre safety helmets.

5. Automotive replacement parts as defined by Order L-158.

Text of WPB Utilities Order U-5

Part 4504 Communications

(Utilities Order U-5[1])

The fulfillment of requirements for the defense of the United States has created a shortage in the supply of certain types of wire communication equipment for defense, for private account, and for export; and the following order is deemed necessary and appropriate in the public interest and to promote the national defense.

§ 4504.1 Utilities Order U-5—(a) **Definitions.** For the purpose of this order:

(1) "Person" means any individual partnership, association, business trust, corporation, governmental corporation or agency, or any organized group of persons, whether incorporated or not.

(2) "Manufacturer" means any person manufacturing wire communication equipment, parts or attachments thereto, of the kinds listed in Schedule A, to the extent that he is engaged in such manufacture, and shall include sales and distribution outlets controlled by said manufacturer.

(3) "Distributor" means any person other than a manufacturer regularly engaged in the business of leasing or selling wire communication equipment, parts or attachments thereto, to dealers.

(4) "Dealer" means any person (other than one engaged in rendering wire or radio communication service), regularly engaged in the business of offering wire communication equipment, parts or attachments thereto for sale or lease at retail to the consumer.

(5) "Wire communication equipment" shall include, but not by way of limitation, new and used wire telephone and telegraph communication equipment, parts and attachments thereto (including wire intercommunicating systems) of the kinds listed in Schedule A.

(b) **General restrictions.** (1) Regardless of the terms of any contract of sale, purchase, rental or other commitment, no manufacturer, distributor or dealer shall accept any purchase, rental or other order for wire communication equipment, parts or attachments thereto including, but not limited to, those included in Schedule A which is attached and made a part of this order, except a purchase, rental or other order bearing a preference rating of AA-5 or higher; and no manufacturer, distributor or dealer shall sell, lend, lease, rent, deliver or otherwise transfer any such wire communication equipment, parts or attachments thereto, nor shall any person receive or accept deliveries of any such equipment, parts or attachments thereto from a manufacturer, distributor or dealer except to fill a purchase, rental or other order bearing a preference rating of AA-5 or higher. **Provided, however,** That this paragraph shall not prohibit the transfer or delivery of wire communication equipment to a manufacturer for repair or storage or the return of said equipment to the owner thereof after repair has been effected or storage terminated.

(2) Notwithstanding the provisions of paragraph (b) (1), wire communication equipment, the order for which bears a preference rating of A-7 or higher and has been accepted by a manufacturer, distributor or dealer prior to January 2, 1943 or which bears a preference rating of A-1-a or higher and has been accepted by a manufacturer, distributor or dealer prior to April 1, 1943, may be manufactured and/or transferred and/or delivered.

(3) Notwithstanding the provisions of paragraph (b) (1), no telephone "operator" as defined in Utilities Order U-3 and no telegraph "operator" as defined in Utilities Order U-4, shall sell, lend, lease, rent, deliver or otherwise transfer any wire communication equipment to any other such "operator" except in accordance with the provisions as to sale of materials by an operator from stock contained in Utilities Order

(Please turn to page 57)

Equipment for Combat

TO see in the dark and to see at a greater distance ...to push back the clouds and fogs of ignorance has been since the beginning of time one of man's greatest aspirations.

Spurred by war, the scientific laboratories of the nation are making tremendous strides toward meeting this aspiration.

In every branch of the services our fighting men are now armed with electrical devices which enable them to pierce the black of night, the depths of the ocean and the clouded skies. Already much of our success over our enemies on land, sea and in the air has been achieved through the use of these "electrical cats."

The peacetime possibilities of these devices which pierce the darkness are limitless.

In the very forefront in the design and manufacture of these developments stand Western Electric and its engineering organization, the Bell Telephone Laboratories.

Western Electric

IN PEACE...SOURCE OF SUPPLY FOR THE BELL SYSTEM.
IN WAR...ARSENAL OF COMMUNICATIONS EQUIPMENT.

Personalities

H. F. McCulla, general commercial superintendent of the Lincoln (Nebr.) Tel. & Tel. Co. was toastmaster at the annual Chamber of Commerce banquet held in Lincoln last month.

●

Chester I. Barnard, president of the New Jersey Bell, in his position as national president of the USO now finds himself head of the biggest amusement organization this country has ever known. The USO operates three circuits which appear in Army camps and over 20 companies have been sent abroad to fronts oll over the world.

●

Henry Smith, manager of the Columbia (Penn.) Telephone Company, delivered an address to his local Rotary Club last month. Pennsylvania Association executive secretary **H. M. Stewart** liked it so well he had it reproduced in the Association General Letter. We are pleased that **Mr. Smith** credited and quoted our February 1 issue in his address.

●

W. C. Martin, district manager of the Minnesota-South Dakota district of the Central Electric & Telephone Co., Sioux Falls,, S. Dak. was awarded the handsome collection trophy when awards were made for 1942 records recently. **C. C. Ward,** district manager of the Virginia-West Virginia area won the leadership award for telephone sales.

●

J. C. Blocker is the new manager of the Platte City, Mo. exchange of the Western Light & Telephone Co. He was formerly a banker in Belton, Mo.

●

Charles D. Cole, 81, former general counsel of the A. T. & T. Company died recently at his home in Morristown, N. J.

●

Hawthorne Winner has been named office manager of T. J. Cope, Inc., Philadelphia, Pa. In his new post **Mr. Winner** will have charge of the accounting, purchasing and personnel functions of the company as well as general office management, and is planning a revision of the plant and office record keeping systems. In his last position, as assistant to the vice-president of the Carey-McFall Company, he developed a cost system for daily executive control of plant operations. The Cope firm, in addition to the manufacture of cable installation equipment, is engaged in fulfilling numerous special war contracts.

B. C. Burden

B. C. Burden, formerly technical editor of TELEPHONE ENGINEER and now engineer of the USITA will deliver a paper entitled "Effect of Electronic Developments on the Post War Telephone Plant" at the Spring Executive Conference this month. He is chairman of the Plant Committee.

●

Mrs. Gail Padgett manages the Mace (Ind.) Telephone Company while her husband is serving in the armed forces.

●

Kelly McNish, president of Inter-Mountain Telephone Co., Bristol, Tenn., has been made chairman of the Commercial Committee of the United States Independent Telephone Association.

●

W. Y. Ramsay, for many years telephone manager at Petersburg, Illinois, observed his eightieth birthday at his home on March 2. He entered the telephone service in 1905 at Chicago and went to Petersburg in 1907 as manager which position he held until retirement in 1940, at which time his son, William Ramsay, succeeded him.

●

Frank Rush, repairman for the Illinois Telephone Company at Jacksonville, was killed by falling from a roof of a business building to a concrete court on March 5th.

●

Boies C. Hart, vice president and manager of the overseas division of the National City Bank of New York, March 29 was elected a director of the International Telephone and Telegraph Corporation. Mr. Hart has been with the National City Bank since 1916 and served for many years in the bank's branches in various foreign countries. He become a vice president early this year in charge of the overseas division.

●

Roy C. Corderman, engineer of the American Telephone and Telegraph Co. on leave, was appointed recently assistant chief of the Bureau of Communications Facilities of the OWI's Overseas Branch.

●

Homer J. Wright, for the past ten months Plant Superintendent of the South Carolina Continental Telephone Company, Sumter, South Carolina has been commissioned a 2nd Lieutenant in the Signal Corps and reported for duty at Fort Monmouth, N. J. on March 15th. Prior to coming to Sumter in April, 1942, Mr. Wright was for six years District Manager of Georgia Continental Telephone Company properties in south Georgia with headquarters at Dawson.

●

Elmer E. Lamberson for the past four years Equipment Superintendent for the South Carolina Continental Telephone Company succeeds Mr. Wright as Plant Superintendent. Before coming to Sumter in 1939, Mr. Lamberson was associated with the Missouri Telephone Company at Macon and Columbia.

Text of Utilities Order U-5

(Continued from page 54)

U-3 or Utilities Order U-4, as the case may be.

(c) **Existing contracts.** Fulfillment of contracts in violation of this order is prohibited regardless of whether such contracts are entered into before or after September 8, 1942. No person shall be held liable for damages or penalties for any default under any contract or order which shall result directly or indirectly from compliance with the terms of this order.

(d) **Applicability of regulations.** This order and all transactions affected thereby are subject to all applicable provisions of the regulations of the War Production Board, as amended from time to time.

(e) **Communications to War Production Board.** All reports required to be filed hereunder, and all communications concerning this order, shall, unless otherwise directed, be addressed to: Office of War Utilities, War Production Board, Washington, D. C., Ref.: U-5.

(f) **Appeals.** Any appeal from the provisions of this order shall be made by filing a letter in triplicate, referring to the particular provision appealed from, stating fully the grounds of the appeal.

(g) **Violations.** Any person who wilfully violates any provision of this order, or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any department or agency of the United States, is guilty of a crime, and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using, material under priority control, and may be deprived of priorities assistance.

(h) **Reports.** All persons affected by this order shall execute and file such reports as the War Production Board shall from time to time require.

(P.D. Reg.1, as amended, 6 F.R. 6680; W.P.B. Reg. 1, 7 F.R. 561; E.O. 9024, 7 F.R. 329; E.O. 9040, 7 F.R. 527; E.O. 9125, 7 F.R. 2719; sec. 2 (a), Pub. Law 671, 76th Cong., as amended by Pub. Laws 89 and 507, 77th Cong.).

Issued this 1st day of April 1943.

War Production Board,
By J. Joseph Whelan,
Recording Secretary.

Schedule A

General categories of wire communication equipment, parts or attachments thereto, to the extent used for and/or in conjunction with wire communication, limited by Utilities Order U-5.

1. Switchboards and switching systems including local telephone, central

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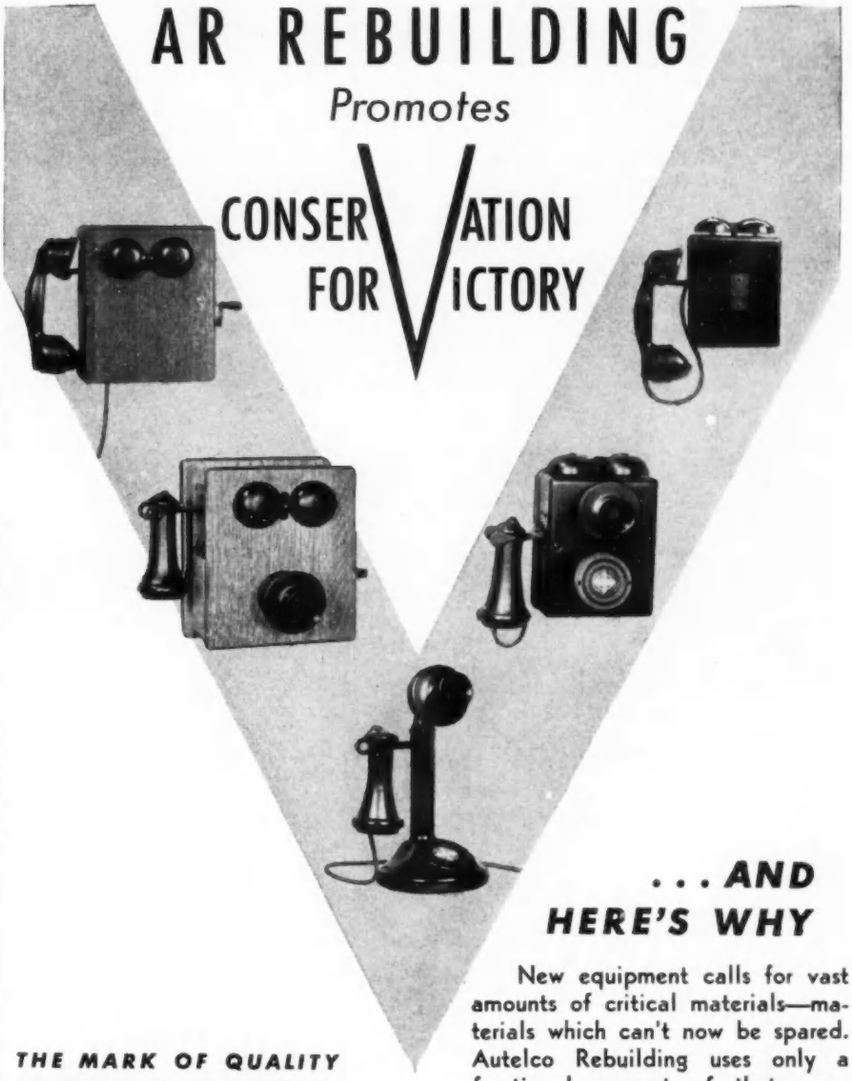

. . . AND HERE'S WHY

New equipment calls for vast amounts of critical materials—materials which can't now be spared. Autelco Rebuilding uses only a fractional amount of that same material yet furnishes high-grade, up-to-the-minute telephone service for your customers.

Autelco Rebuilding Service is applicable to your every problem—for every type of manual or automatic equipment. You may set up a complete plan for renewing all your apparatus over a period of time. You will be preserving the finest telephone service in your community and you'll be helping Uncle Sam at the same time. Write today for further information and prices.

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NOTE: Orders for Autelco Rebuilding service may qualify for priority rating under Maintenance and Repair. Please include priority certification with all orders.

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ORIGINATORS AND DEVELOPERS OF STROWGER STEP BY STEP MACHINE SWITCHING AUTOMATIC DIAL SYSTEMS

MAKERS OF TELEPHONE, SIGNALING AND COMMUNICATION APPARATUS
ELECTRICAL ENGINEERS, DESIGNERS AND CONSULTANTS

Distributors in U. S. and Possessions:
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1033 W. Van Buren St., Chicago, U. S. A.
Export Distributors: AUTOMATIC ELECTRIC SALES COMPANY, LIMITED

office, toll telephone, PBX telephone and telegraph.

2. Telephones including transmitters, receivers, dials, subscriber sets.

3. Relays, condensers, repeaters, coils, filters and carrier systems.

4. Testing apparatus.

5. Wire and strand.

6. Cable.

7. Cable terminals.

8. Pole line hardware.

9. Plugs, jacks, cords, keys.

10. Wire intercommunicating systems.

11. Varioplex, multiplex, facsimile and telautograph equipment.

12. Teletypewriters, printing telegraph machines, tape perforating apparatus and accessories.

13. Appliances used for manual telegraph.

14. Time clocks, time switches, call boxes, signaling and selector equipment used for telephone and telegraph systems and/or used for wire protective alarm systems.

15. Motors, generators, storage batteries, rectifiers, transformers, power panels and associated equipment.

---

[1]General Conservation Order L-148 has been revoked and is superseded by this order.

Economics of WARTIME MAINTENANCE PRACTICES

(Continued from page 34)

which were not definitely cleared during the winter, probably because of unfavorable weather conditions, must be listed with the advent of spring. With such a list at hand the work should be systematically carried out beginning at the cases nearest the Central Office and clearing up all bad cable pairs, imperfect splices, broken or missing rings or hangers, rusted messenger and missing bonds. The actual work should be preceeded by the making of a careful survey of the entire Aerial Cable plant however to insure attention to every condition requiring any work and to every case of deferred maintenance. It may be necessary, in some cases of badly damaged cable, to ride the messenger and inspect the entire cable sheath. The point to be given emphasis is that no potential cause of service failure shall be allowed to remain in the Aerial Cable plant now that spring and good weather are here. This suggestion will be at once challenged, no doubt, on the grounds that every telephone company plans to clear all unsatisfactory outside plant condition when the weather permits. This is true but war time is a period when these matters must not be left to the orderly and usual sequence of events. The likely causes of service interruptions must be eliminated as the Basic and Prime Requirement of war time maintenance at the **earliest possible moment** that it is possible to do so. The matter has ceased to be one permitting the arrangement of the work as in normal times. Regardless of lost time later and possible greater costs now the service, as a patriotic and vital task, must be safeguarded from the causes of future failure.

Underground Cable

UNDERGROUND Cable has been assigned the secondary position in the order of importance. This is because Underground Cable is less likely to be in need of repair operations than Aerial Cable due to its underground protection and because the reserve capacity in pairs of conductors in Underground Cable is likely to exceed the reserve capacity in Aerial Cable. In our opinion the Underground Cable should be entirely cleared of all conditions likely to give rise to any kind of service impairment at the same time as the Aerial Cable is being cleared or immediately afterward in cases when it is not possible to secure the necessary help for both.

Aerial Wire

AERIAL Wire, because of its fragile character, is the location of very many of the causes of service interruption. It is also the part of the outside plant which receives the most intensive attention from the maintenance staff throughout the year. When spring arrives it is almost a telephone maintenance tradition that the slack shall be pulled out of the open wire and this operation which is simple but tedious under normal conditions must be carried on with the greatest care under the present war conditions. This is because it is very difficult to secure replacement open wire and certainly it is the patriotic part to make the utmost use of all existing materials in order to avoid possible shortages in the actual combat field. It is the author's opinion that much time will be saved in the task of pulling slack

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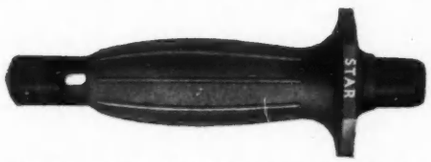
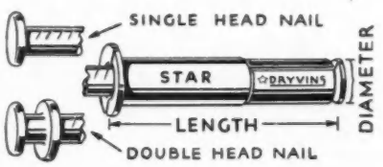


Rubber Grip Holder—Type No. 5200

Knockout Pin

Plain Holder—Type No. 1400

Hammer Drill Point—Type No. 4200



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Hammer Drive Anchors—Type No. 3900

★STAR TAMPIN

Machine Bolt Shield—Type No. 4000

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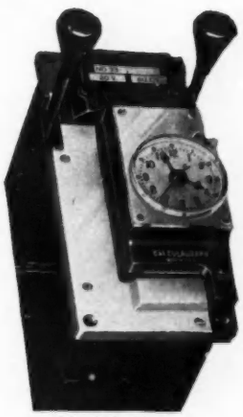
Boston	St. Louis	Cleveland	San Francisco
Chicago	Buffalo		Seattle

To help compensate for the growing shortage of toll operators, telephone companies everywhere are using Calculagraphs to increase the efficiency of their present operators so they can handle more calls more accurately.

The Calculagraph relieves operators of the time and work required to figure the time taken for toll calls, and of the responsibility of figuring correctly.

The Calculagraph automatically figures the elapsed time to the second and provides a permanent printed record on cards of every call.

It is made in spring-drive and electric models. Write for particulars.



Model 33

CALCULAGRAPH CO.

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CALCULAGRAPH

Accurate Toll Timing to the Second!

if hit and miss methods are abandoned and the tension for each wire adjusted to its proper value by the use of some device like the Dillon Dynamometer.

The prime object to be sought and the only object that is being considered in these suggestions is the elimination of the preventable causes of service failure and the **maximum usage of plant materials.** Old line wire must be handled with the greatest of care especially if it is iron wire. This means, of course, that line wire must be pulled up only to a tension at which it will be reasonably free from the danger of swinging crosses but somewhat below the proper tension used if new wire were being strung. Here a little preliminary experimental work with the Dynamometer will disclose the allowable tension for the old wire and will result in the continuance in service of much old wire that otherwise and in normal times would be replaced by now. High resistance joints must be eliminated, of course, and very old iron wire cannot be successfully respliced in many cases.

In very light leads it is our opinion that the bridging of splices with copper wire carefully soldered to the line each side of the splice is justified by present conditions. In such leads the truck can be backed under the wire and the defective joint resistance eliminated with little trouble.

It is quite likely that this concrete suggestion will provoke a storm of controversy but since the Economics of war time maintenance is under consideration and since the assurance of **uninterrupted service** is the **prime object** it appears that the continuance of old line wire in service is worthy of favorable consideration. In heavy leads with higher poles such an expedient is not possible, of course, but it is perfectly practicable in light rural leads and in such leads the assurance of continued service is most important as has been pointed out.

Pole Lines

POLE Lines comprise a large part of the total investment in any telephone plant. For that reason their conservation, in normal times, is deserving of the most careful and thorough study. Since the average service life, for any given type of pole and in any given location may be closely approximated and reasonable provision for the depreciation may be made it is possible to reach a satisfactory economic balance between the annual cost of Pole Line maintenance, the annual cost of depreciation and the service life fixing the time at which given units may be retired.

In war time when the assurance of uninterrupted service on the one hand and the use of material in service for the longest possible time consistent with the reasonable attainment of the prime requirement (uninterrupted service) on the other are the controlling factors, individual units must be studied and repairs made rather than replacements whenever possible. Resetting and stubbing, to a degree not justified under normal conditions, are the accepted procedures. The preparatory survey under these conditions is directed to the object of spotting poles which can be kept in service many of which would under normal conditions, call for removal for economic reasons. It must not be forgotten that any survey of the pole lines should disclose the anchers that are out of line and the guys that are slack as well as the locations where new anchors should be installed. Those anchors which have shifted or which are not properly located for any reason should be reset. This operation should be carried out on all pole leads whether the spring time is one in a war year or a peace year. It is important to remember, however, that the life of any pole line as a whole is extended by properly located and installed anchors. Guess work in this matter can be entirely eliminated by the use of Dillon Bisector or some similar device and all guess work in connection with the installation of anchors and guys should be definitely abandoned **at all times.**

HELLO, NEIGHBOR PIONEERS!

As I near the day of retirement, when I lay aside my daily routine of assisting in furnishing telephone service to my neighbors, I confess I am proud of the minute part I have been privileged to play in serving humanity —in bringing all people closer together, by stretching the confined boundaries of man's neighborhood.

In 1897 while yet a boy in my early teens, J. K. Johnston, now secretary-treasurer of Independent Pioneer Telephone Association, assisted by my older brother and I built the first independent toll lines in Logan and parts of Hardin County, Ohio. Yes, it would be quite amusing to our younger pioneers, if I were to relate here the crude methods we used in construction, but when one reaches the age where he can view in the past some forty years of telephone pioneering, he will recall much that to our younger generation would seem quite queer, as well as comical, but may I say to each infant pioneer, I am not bold enough to predict that each of you will not see as much or more advancement in the art of transmitting the human voice, in your generation than Mr. Johnston and I were permitted to see.

Pioneering? Yes, I expect to be pioneering on the last day before my retirement, and I prophesy you will be doing the same. While we, in my estimation, gave more in the way of hardships, long hours, and physical strength than you will be called upon to give, yet you will be pioneering, pressing forward to the unfinished task, with a helping hand extended to the beginner. Pioneering in a machine age. Serving your neighbor by giving more and better telephone service.

Yours respectfully,
J. M. Roberts,
Walla Walla, Washington

Subscribers' Station Equipment

SUBSCRIBERS Station Equipment maintenance is only partially a seasonal activity for the telephone company. TELEPHONE ENGINEER recently published a description of an excellent test set by means of which defective transmitters can be readily discovered (A Portable Transmission Measuring Set, E. R. Collins, TELEPHONE ENGINEER, March 15, 1943) and the detection of imperfect transmitters as well as other elements of the Subscribers' Station Equipment is fully as essential as the elimination of other causes of preventable service interruptions.

It will undoubtedly be remarked that the foregoing is but a rehash of facts which every telephone company already knows. That is or should be universally true but it is to be remembered that the telephone systems of the country are the primary means of communication which are open to the use of the public and which do not require especial training in methods of operation if and when the territory of THE UNITED STATES is attacked. The fullest preparation for this task lies at the door of the telephone industry and is being thoroughly and efficiently prosecuted.

With reduced staff, skimping on the use of new material, but with everyone from Janitor to President determined to meet the demands of the situation in which our country finds itself the telephone industry may be relied upon to make sure that its 1943 Spring Maintenance program will be geared to the elimination of all preventable causes of service interruptions, not as a matter of conventional routine management but rather as a matter of Management Economics geared to the National Effort to Win the War.

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LENZ *The Mark of Quality*

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CABLE SWITCHBOARD AND INTER-PHONE, SILK AND COTTON INSULATED, BRAIDED AND LEADED.

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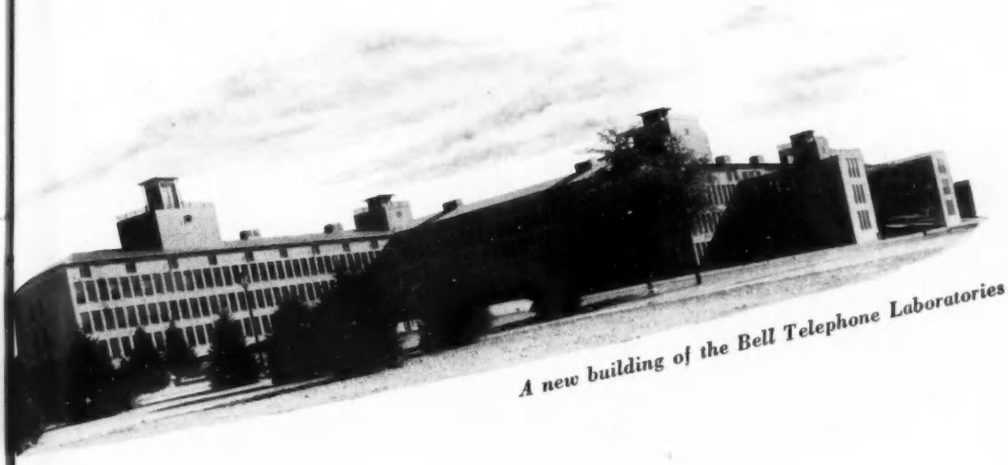
A reassuring report on American research

In normal times, advances in science are well and widely publicized. In time of war, the details of technical progress must be closely guarded. But the nation has a right to know that research is continuing and successful. As a public service, the Bell System makes the simple report that appears on the opposite page—in national magazines during April and May.

An advertisement of the Bell Telephone System



A new building of the Bell Telephone Laboratories

Reason for Confidence

More than ninety per cent of American scientists are engaged in beating the Germans and Japanese.

More than ninety per cent of American scientific laboratory facilities are devoted to the same task.

American scientists are working at this job six or seven days a week, long hours, with few interruptions.

They are getting somewhere, too.

Every now and then the Germans and the Japanese have an unpleasant surprise.

They find that American science has caught up with them and passed them.

It is reassuring to us and discouraging to our enemies, for American scientific facilities are the greatest in the world. And they are functioning.

Little by little, some of the things that have been developed become public, but most of them you won't hear about until after the war.

But now, without the details, you can have faith that American research — industrial and academic combined — is rapidly giving our fighting forces an advantage.

Along with other American industry the Bell Telephone System has its own Bell Laboratories — the largest in the world — working overtime for victory.

BELL TELEPHONE SYSTEM

Your continued help in making only vital calls to war-busy centers is a real contribution to the drive for victory

Maintenance—

Making a Little Go a Long Way

(Continued from page 30)

membered that the higher the temperature at the time the slack is pulled, the greater should be the sag left in the wire; otherwise the wire may be subjected to severe strain as the result of contraction in cold weather.

Line Transpositions

LINE transpositions are made at the time of the construction of the pole lead for the purpose of nullifying cross-talk effects and the inductive influence of adjacent power lines. Sometimes, however, there is need to change or cut in new transpositions to take care of cross-talk or power line noise that later develop. In such cases, it is well to check the possibility of defective line splices upsetting the transposition balance of one or more lines by introducing excessive resistance in one side of the line. If a check shows the line to be free from high resistance splices and no other faults can be found, the line may require re-transposition. Transposition schemes have been adequately discussed in other articles and will not be covered here.

Transpositions are best accomplished by means of special brackets designed for this purpose. Since metal brackets are on the list of scarce materials, regular wood pole brackets may be employed for this purpose on exchange leads. Another method is to use 9-inch insulator pins with two piece insulators, though this is not considered quite as satisfactory as regular transposition brackets or pole brackets.

Tree Trimming on Pole Leads

AN adequate tree trimming program is the answer to the problem of service interruptions due to line leakage resulting from the foliage of trees growing along a pole lead. Tree trimming is best accomplished in the winter time when the limbs are bare of leaves and a more symmetrical job of trimming can be done than in the summer time. It is also easier to obtain the property owner's consent for the company to trim his trees along the right of way at this time. The trimming should be thoroughly done. It would be foolish to cut the twigs and branches away for only a foot or so from the line wires, since foliage grows very rapidly and would soon render such an inadequate trimming job useless. Figure 6 shows how a tree should be trimmed to clear an open wire line.

Maintenance of Cable Plant

SINCE lead and copper are very critical materials, it is very important that preventative maintenance principles be applied to the care of cable plant. Open wire plant is subject only to service interruptions when neglected, but cable suffers irreparable damage if it is not properly maintained at regular intervals. New cable is impossible to secure for extensive replacements at this time.

Preventive maintenance of cable requires two co-related programs, viz., correction of defective construction which may result in cable damage, and periodic inspection and repair of damaged cable sheath. In small exchanges the two programs may be combined as one and handled at one time.

Correction of Faulty Cable Construction

FAULTY cable construction is usually the result of improper methods followed at the time the cable was installed; often it is caused by neglect of the plant, as for example, failure to properly trim trees along cable leads and to pull up slack guys.

The following are rather common faults to look for in an examination of the cable plant prior to its overhauling: inadequate protection of cable passing through trees; excessive slack in cable spans; and "creeping" cable at corners and on grades.

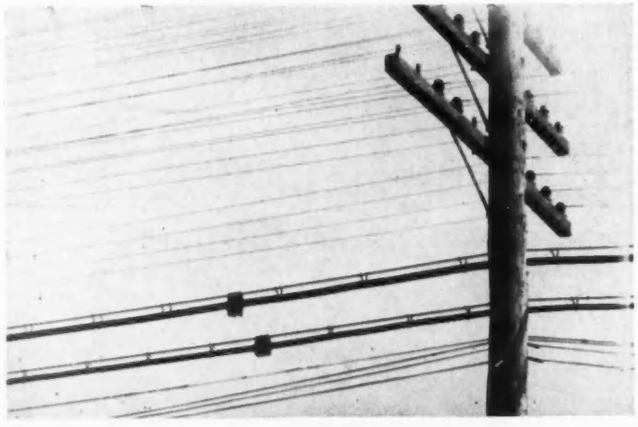


Fig. 8—Use of grade clamps to prevent cable creeping on down grades.

Protection of Cable Passing Through Trees

ONE of the most common sources of cable trouble is inadequate protection of the cable from contact with tree limbs. Crystallization of the cable sheath is an inevitable result of the tree limbs rubbing on the cable or even on the messenger alone, which sets up more or less vibration in the cable.

The only sure cure for this type of fault is to trim the tree at periodic intervals, keeping the limbs well away from the cable and messenger. Wood moulding around the cable may be used as an alternative remedy (See Figure 7) if tree trimming is not possible, but it does not always give adequate protection. Indeed, sometimes the use of wood molding indirectly results in another form of sheath damage, that due to squirrels crawling out on the molding and gnawing the lead sheath close to the end of the molding.

Other methods of protecting cable from contact with trees consists of lowering or raising the cable to pass below or above large tree limbs, and pulling the cable to one side to avoid a limb by means of wire or strand fastened at one end to a hook attached to the tree trunk and at the other end to a suspension clamp attached to the cable messenger.

Slack in Cable Spans

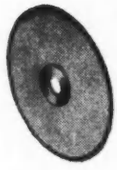
EXCESSIVE slack in cable spans causes ring cutting as the result of movement of the cable and messenger under wind pressure.

Slack spans more commonly occur at the end of a cable lead which is not adequately guyed or not guyed at all. The remedy is to pull the guy tight or place heavier anchors to hold the guy better. Where it is impossible to place a guy at the end pole, a braced pole arrangement will solve this problem.

Missing or improperly spaced rings in a cable span will cause the cable to sag at the unsupported points, placing a severe strain on the cable sheath.

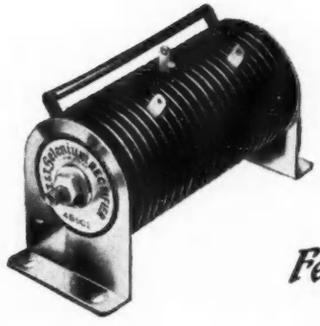
Sometimes a pole will break off below the ground line and tilt or settle to one side. A pole in this condition should be replaced with a new one as soon as it is discovered, not only because it is dangerous to allow a broken pole to remain in the cable lead, but

Official U. S. Navy Photograph



Special Assembly Method — *showing single metal washer which facilitates protective coating against corrosion*

Standard Assembly Method—*showing conventional petal-shaped brass contact washer*



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Thus the organization which was first to introduce Selenium Rectifiers in the United States is now first to extend their many advantages to marine and other high humidity services.

Compact, light, electrically and mechanically stable – with no moving parts to wear out or cause failure – I. T. & T. Selenium Rectifiers have set a standard for the industry.

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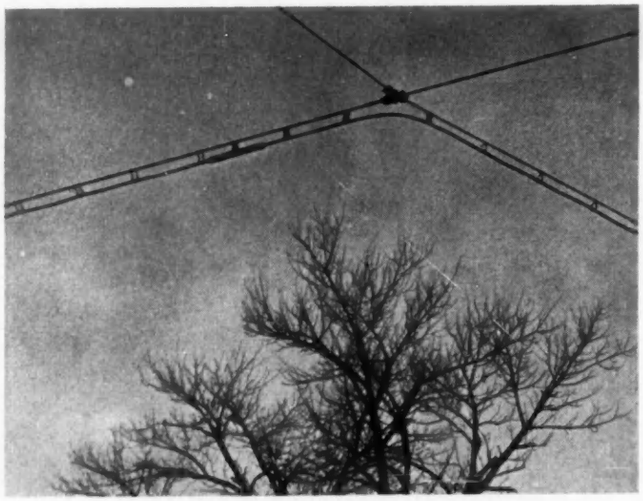


Fig. 9 — A well-made aerial cable turn.

because the swaying of the pole in the wind will crystallize the cable sheath. Poles that are loose in the ground will cause the same trouble and must be thoroughly tamped back into place.

Causes of "Creeping" Cable

CABLE leads on a down grade have a tendency to creep along the grade, resulting in bowing of the cable at the lower end and a severe strain on the cable at the top of the grade. Properly placed grade clamps are an effective means of preventing this trouble. If a steep grade is encountered, the clamps should be placed one at every four to six poles. Figure 8 shows the use of grade clamps on a cable lead.

Unless a cable corner or turn is properly made, the cable may creep away from this point, causing the cable to be pulled tight against the rings, resulting in sheath breaks or cracks. This trouble will not occur if sufficient slack is left in the cable to form a well-rounded corner, as illustrated in Figure 9.

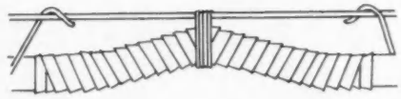
Inspection and Repair of Cable Sheath

Aside from the correction of faults in cable construction described in the foregoing, a periodic inspection of cable sheath is necessary to detect damage to the sheath from causes such as ring cutting, crystallization, and breaks or cracks in the sheath. This inspection is made by going over the route of each cable lead and jotting down the location of defects found on a cable map. This examination is followed by a step-by-step repair of the damaged places in the cable.

Ring cuts and minor cracks or breaks can be resoldered, using plain solder with sterene flux. It is possible to repair small sections of crystallized cable by flowing solder over the damaged places in the sheath with the aid of a blow torch. Large sections of crystallized cable (about ten feet or so) are best replaced by good used or new (if available) cable. One company has successfully concluded the repair of a cable plant that had been condemned as unfit for further service. All ring cuts, sheath breaks and cracks, and crystallized sections of the cable were repaired by the methods just outlined, and this plant has been giving satsfactory service since then.

Temporary repair of sheath cracks and breaks may be made by applying two reverse layers of friction tape over each crack two inches on each side and then painting the tape with asphalt paint. Although such a repair is intended to be replaced by a permanent one within six months, the tape and paint protection will actually last several years.

If a break in the cable sheath results in moisture entering the cable, it will be necessary to boil out this section of the cable to remove the moisture. The method is to open the sheath by means of a cable knife, removing the section containing the break, and boiling the core out with paraffin. The core is then wrapped with two layers of muslin tape, followed by two layers of friction tape laid on in such a way that the lapped tape will shed water like a shingle roof when the center of the taped core is tied up to the messenger, as illustrated in Figure 10.



Note: Inner muslin layers overlap on cable sheath for a distance of 3" on each end of the wrapping. Outside friction tape layers overlap an additional 3" on each end.

Fig. 10—Temporary repair of cable sheath break when moisture penetrates to core.

Maintenance of Drop Wire

OF all items of plant material, drop wire is perhaps the most difficult to obtain, for it contains rubber and copper, both very critical materials. At the same time, it is the most perishable of all materials used in the outside plant. The preservation of drop wire thus is a very important part of the present preventive maintenance programs of telephone companies.

The following procedures are helpful in conserving drop wire: correcting faulty drop wire installations; repairing defective drop wire and recovering unused drop wire; employing substitutes for drop wire wherever possible.

Correcting Faulty Drop Wire Installations

INCORRECTLY made drop wire ties and abrasion of the drop wire against trees and buildings are among the most common causes of drop wire failure.

Although it is desirable to use drop wire clamps or snubber grips as the most reliable method of attaching drop wire to its supports, more attention may eventually have to be paid to the older methods of tying drop wire to the supports; since the clamps are made of a very scarce material and may no longer be available. A poorly made drop wire tie may soon develop a short or ground as the result of the tie wire cutting into the insulation under vibration of the drop wire span. Figure 11 shows the proper steps in making a parallel drop wire tie at a span support.

Drop wire is very susceptible to damage through abrasion if allowed to come in contact with trees or buildings. There is only a single braid covering to protect the rubber installation over the conductors and, once the braid is ruptured, this insulation wears off rapidly, causing the drop wire to soon become unserviceable.

The most effective remedy for drop wire abrasion is to relocate the drop wire to avoid contact of the span with trees or other obstructions between the cable terminal and the subscriber's residence. If it is impossible to avoid contact with an obstruction, the drop wire must be protected by means of a section of loom securely taped to the drop wire at the ends of the protective covering. Tree wire has better protection than the ordinary drop wire and loom combined because of its very heavy braid which is highly resistant to wear. If this kind of wire is available, it may be cut into exposed sections of the drop wire span.

Another fault to be on guard against is excessive tension in a drop wire span resulting from too much slack being pulled by the installer when

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MORE EFFICIENT Protek-Sorb Desiccant has more than twice the moisture capacity of other desiccants.

QUICKER PERFORMANCE Protek-Sorb Desiccant, due to its amazing capacity, absorbs moisture almost instantly. Return to normal insulation resistance is faster.

TROUBLE-FREE SPLICES Protek-Sorb Desiccant assures a permanently dry splice . . . reduces maintenance costs and labor.

ABSOLUTELY SAFE Use of Protek-Sorb Desiccant eliminates the danger of the "boiling-out" method — the inconveniences of "oven-drying". It is chemically inert and non-reactive . . . does not give off fumes or odor.

EASY TO USE Small mesh size assures perfect distribution throughout the splice. Supplied in ready-to-use containers in pre-determined quantities for correct application. Instruction sheet (obtainable from your regular jobber) illustrates recommended procedure and shows exact amount of Protek-Sorb necessary for efficient drying of splice.

Protek-Sorb is a superior desiccant . . . does a superior job. Approved by leading manufacturers and suppliers of telephone equipment.

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THE extra strength in AMERTEL High Tensile Wires saves maintenance men a lot of worry. For these tough wires—AMERTEL-85 and AMERTEL-135—have the stamina to withstand the strain of heavy wind and ice loads. That means greater freedom from breakdowns that might hamper service vital to the war effort.

AMERTEL Wires save in many ways. They reduce construction time. The longer spans made possible by their extra strength mean fewer poles, less hauling, less digging and less connecting. And this all adds up to marked savings in much-needed man-power and materials, without sacrifice of electrical efficiency.

ALL AMERTEL WIRES — including "EBB", "BB" and "Steel" grades—as well as AMERSTRAND Steel Strand, are produced to a high standard of "Controlled Quality". Every production step—from ore to finished product—is under strict control and experienced supervision. The zinc coating is applied by a special galvanizing process which offers maximum protection against corrosion.

These tags are placed for your protection on every coil of AMERTEL Telephone and Telegraph Wire and AMERSTRAND Steel Strand. They are your assurance of highest quality.

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United States Steel Export Company, New York

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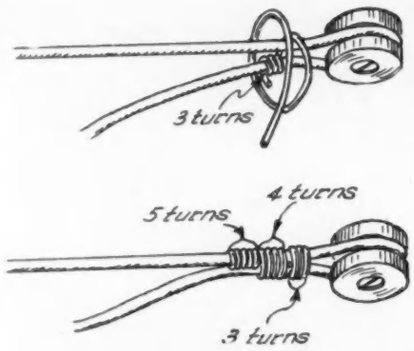

Fig. 11—Steps in making a parallel drop wire tie.

first placed. Drop spans should always have sufficient slack to reduce strain on the conductors to the minimum and place less tension on drop wire ties at the span support.

Repair and Recovery of Drop Wire

RATHER than replacing an entire section of drop wire span whenever it develops a defect, the wire should be carefully examined for the defect and repaired. A break in the conductor should be repaired by resplicing or, if the span is likely to be made too short in this process, by cutting in a short section of good used or new drop wire. Compression or rolled type sleeves are best for this purpose. Each splice should be staggered and wrapped with two layers of friction tape, after which two reverse layers of friction tape should be applied over the whole.

If the drop wire braid is worn or frayed in places, the wire may be wrapped with two reverse layers of friction tape to extend the life of this wire. Only when there is extensive peeling of the braid and there is immediate danger of service failure, should the drop wire be replaced, and then only in the badly worn sections.

All unused drop wire should be recovered and re-used where possible. Drop wire can be recovered from residences of subscribers who have discontinued their telephone service and there is no possibility of the service being renewed within a reasonable period (sixty days). The drop wire may be taken to the company storeroom and repaired and spliced into coils of several hundred feet for redistribution. It is important to cut out all kinks and bends in the wire and make sure the braid and rubber insulation is at least fairly intact. The latter condition is easily checked by tightly wrapping the wire around a ⅜" rod, such as a crossarm bolt, to see if the braid remains firm under this treatment.

Substitutes for Drop Wire

AN iron wire lead run directly a subscriber's residence may become a necessary substitute for drop wire. Under certain conditions, it may also be feasible to use open wire leads on brackets or small crossarms in lieu of drop wire strung from pole to pole.

Conclusion

AT the present time when replacement materials are becoming increasingly difficult to obtain in any quantity, methods of conservation in addition to preventive maintenance methods are essential to the continued high grade of service rendered to subscribers. This article has described a few of the conservation methods in effect during the past year. Not a few of the companies have developed methods of salvaging all recovered outside plant material. In spite of the fact that some of the salvage processes are rather expensive considering the pre-war value of the recovered materials, every item of re-use value is being salvaged.

10 Important Items to Remember

R. H. Harlow, District Supervisor, of the Ashland Home Telephone Co., Lancaster, Kentucky, presents timely reminders for the Plant men in the current "Kentucky Circuit Rider." These practices, if followed over a period of time, will result in amazing rural line improvement.

Proper maintenance of existing rural line facilities is now, more than ever before, important, since in most instances construction of pole lines is taboo for the "Duration." Proper maintenance can only be achieved by covering the line and repairing each item, however small. This will result in substantial reductions of trouble which will in turn reduce operating costs; not to speak of gas and tire conservation by elimination of excessive trouble trips.

1. **A certain amount of pole replacing can be done at this time. Corner poles with push or back braces in leads up to four brackets can usually be replaced with a heavier class pole and keyed to eliminate either the push brace or guy, thus saving that much in material and labor. In many locations obsolete and deteriorated plant exists in rural lines.**
2. **The proper placing of the brackets to allow maximum clearance between wires and also not to gain proper appearance of the lead where four wires are attached should be watched. Corners should be strengthened by wiring the brackets to pole which will eliminate brackets being pulled off, thus in most cases causing an excessive or otherwise needless case of trouble.**
3. **Replacing broken glass is an important repair item. If the glass is broken or cracked the constant movement of the wires in the wind may knick the wire and cause it to break.**
4. **Proper sag in the wires will help to eliminate crosses. If the wires are even they can be allowed more sag whereas if they are uneven they are apt to wrap up even in a mild wind.**
5. **Tying in wires should be done neatly and the ends of the tie turned back so that when untying it is not necessary to use pliers, which may knick the wire and eventually cause breaks.**
6. **One most important item is proper tree trimming for rural lines. Noise, grounds, crosses, cross-talk, and poor transmission are a few of the effects of neglected tree trimming. In some cases it is best to side arm to gain clearance around certain trees where trimming difficulties arise or spacing pins close together on crossarms can be done and will not lend a bad appearance to the lead.**
7. **Crossarms rotting and permitting pins to float or pull the glass down on top of the crossarm should be replaced.**
8. **Proper cleaning of both old and new wire before making splices should be done without fail. Many cases of trouble have been caused by a man making splices without sanding the wires, and trouble of this nature is hard to locate.**
9. **Removal of dead plant from existing leads should be completed not only for appearance but for safety's sake.**
10. **Use foresight and be watchful of small developments that will have a tendency to be a potential case of trouble—eliminate the case when the job or correction requires only a small amount of time—get in the habit of never passing up a small item needing correction now.**

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COMMUNICATIONS and ELECTRONIC Developments

"Spiral 4"

One of the most effective aids in modern warfare is rapid and dependable communications. The success of an engagement may depend on establishing lines to advanced positions in minimum time. To aid the Signal Corps in such work, the Western Electric Company and Bell Telephone Laboratories have recently made available a new communications system known as "Spiral-4."

The basic idea behind Spiral-4 is borrowed from "carrier" telephony, a peacetime development of the Bell System by which several long-distance messages can be transmitted simultaneously over a set of conductors. The Spiral-4 system provides three telephone and four telegraph circuits over a single rubber-covered cable about the thickness of a flat lead pencil. The cable contains four spiralling wires. Hence, the name. It is made in quarter-mile lengths, the ends of which are fitted with weather-proof connectors. Each length may be snapped to a companion section as rapidly as the cable can be payed off a moving Army truck. With intermediate amplifiers spaced along the way to compensate for loss in the strength of the current, distances up to 150 miles may be so spanned.

The seven telephone and telegraph messages cannot be piped directly into the cable. If this were done, they would become hopelessly mixed and garbled. Instead, an electronic instrument at either end of the line first generates "carrier" currents. These currents are cousins of the familiar radio wave. Such currents can retain their identity while intermingling freely in an electrical circuit. The individual messages are then superimposed on the carrier currents, by the terminal mechanism, and, so mounted, ride through the cable pickaback. Upon arrival at the distant end, the electronic device tosses the carrier current into the discard and guides each signal into its own pair of telephone wires.

Unless he were equipped with a highly-complex electronic device of special design, an enemy tapping the Spiral-4 ahead of the terminal point would get nothing for his trouble but an unintelligible mixture of squeaks and squeals.

Man To Man And Gun For Gun

One of the recent news dispatches from the Tunisian front, which related how the Americans were beating the Nazis all around "man for man and gun for gun" in the battles, cited an example of how Signal Corps troops "knew their stuff". It was related that two Signal Corps men—Sergeant Frank Muldoon of Bogoto, N. J. and Private Alexander Baker of Brooklyn, kept on stringing telephone wires although the rear end of their jeep was shot off by an 88mm. shell, which had hit that vehicle the day before. The dispatch gave this as an example of how the American troops were now keeping their casualties relatively light.

Buys Kansas Property

Paul Grauer of Campbell, Nebr. and formerly with the Campbell Telephone Company in that city, has purchased the interest of A. F. Cross in the Wilson (Kan.) Telephone Company. He has moved to Kansas and took over the exchange on March 1. Mr. Cross is retiring.

Indiana Exchange Sale

The Associated Telephone Utilities, Inc., of Petersburg Ind., and Myrtle G. Finch, Orval C. Finch and James Finch of Carlisle, Ind., have petitioned the Indiana Public Service Commission asking that the Associated Company be permitted to purchase the stock of the Carlisle Telephone Co. The entire stock of the Carlisle company, which operates about 275 stations, is owned by the persons named above. Terms of the sale, if allowed, provide for a payment of $4,268.80 in cash and a promissory note for $7,000.00 which would extend over a five-year period. This note would be reduced by monthly payments of principal and interest at the rate of 5%.

New Handbook On Care of Tools

A 32-page handbook titled "Wartime Care of Line Construction and Maintenance Tools" has just been issued by the Graybar Electric Company. This new, handy guide to longer tool life is pocket-sized with a durable binding and fits the needs of everyone responsible for care and servicing of tools, for employee training, and for setting up standard practices.

Subjects covered in the handbook are jacks, tackle, rope, shovels, pliers, cutters, leather and rubber.

The booklet is free. Turn to page 24 of this issue and fill out coupon and mail to Graybar Electric Company, Dept. T. E., Graybar Building, New York.

New, modern office building and plant of Telkor, Inc.

Telkor Moves Into New Building

Although in almost 100% operation on government war orders, Telkor, Inc., of Elyria, Ohio, under the capable managership of H. M. Rich, is already making plans for after-the-war business.

Having been cramped for space in their old quarters for some time they have recently acquired the above pictured factory building and are now in full 24 hour per day production in it. The new building has a frontage of 75 feet and is 100 feet in depth. Offices extend across the fore part of the building while the factory quarters has a high ceiling, plenty of skylights, high and large side windows and everything that modern engineers can install to make for a complete workshop.

In addition to manufacturing Telerings, readers of TELEPHONE ENGINEER are familiar with their Telespot. New improvements and changes have been made in this instrument and according to Mr. Rich "it has always been a wonderful instrument but the new ones will surprise the most skeptical." The Telespot and several other new instruments being developed for use in the telephone field will be put into manufacture as soon as the war is over.

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DESICCANT for CABLE SPLICING

DRIERITE dries the Cable Splice by positive absorption of all moisture from wires, insulation, bandage and surfaces inside the sleeve. Application is easy and rapid.

The snow-white granular **DESICCANT** is neither poisonous, corrosive nor abrasive, and does not evolve gas, fume or odor either in storage or in use. It eliminates all chance of fire, accident or discomfort to workmen or occupants of buildings.

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Telephone Engineer

HANDBOOK TABLES

Subject: Underground Cable Construction Units

Index—Cable Data
Date—April 15, 1943

General

The following table gives typical construction costs for underground cable construction. These are for average conditions in one section of the country.

Item	Material Cost Per Foot	Hours Per 400 Feet L	Labor Cost Per Ft.	Unit Cost Per Ft.
25 pr. 19 ga. cable	.15	7.	.06	.21
50 " 19 " "	.25	8.	.07	.32
100 " 19 " "	.45	9.	.08	.53
150 " 19 " "	.64	9.	.09	.73
200 " 19 " "	.83	10.	.10	.93
300 " 19 " "	1.18	10.	.11	1.29
400 " 19 " "	1.59	10.	.12	1.71
15 " 22 " "	.08	6.	.05	.13
25 " 22 " "	.11	7.	.06	.17
50 " 22 " "	.15	8.	.07	.22
100 " 22 " "	.27	9.	.08	.35
150 " 22 " "	.37	9.	.09	.46
200 " 22 " "	.47	10.	.10	.57
300 " 22 " "	.66	10.	.11	.77
400 " 22 " "	.85	10.	.12	.97
600 " 22 " "	1.29	12.	.15	1.44
900 " 22 " "	1.90	14.	.18	2.08
25 " 24 " "	.08	6.	.05	.13
50 " 24 " "	.13	7.	.06	.19

Kellogg Switchboard Holds Annual Meeting

AT THE annual meeting of stockholders of the Kellogg Switchboard and Supply Company held at the Company's offices at 6650 South Cicero Avenue, Chicago, directors re-elected to serve for the coming year were as follows: John J. Bryant, Curtis B. Camp, S. Ashley Guthrie, John B. Hooker, James G. Kellogg, James H. Kellogg, and Maurice K. McGrath.

M. K. McGrath, President.

Mr. McGrath, president of the Company, stated in his report to the stockholders that the Company had been engaged during the past year, energetically and wholeheartedly, in assisting the Government by the manufacture of vital equipment used in the war. Restrictions, which must necessarily be observed during times of war, prevented disclosure at this time, of facts and figures regarding productive activities during the past year.

"Our regular customers" reported Mr. McGrath, "have felt the impact of war through many new and difficult managerial problems, and by reason of numerous restrictions and conditions curtailing extensions, operations and maintenance of their plant facilities. We have continued to render them service and assistance whenever possible, and we appreciate their continued goodwill and consideration."

James H. Kellogg, Secretary.

In summarizing the Company's position at the present time, Mr. McGrath reported that the balance sheet of December 31, 1942, disclosed a sound financial structure and well balanced current position.

C. D. Manning, Sales Mgr.

"The summary of net income for the fiscal year ended December 31, 1942," he said, "is shown indicating earnings of $212,541.43, after taxes and a provision for contingent liabilities arising out of the war effort. This amount equals 64 cents per share of the common stock after providing for dividends on the preferred stock.

F. M. Parsons, Eastern Mgr.

"Taxes continued to consume the greater part of the Company's earnings with income, excess profits, excise, payroll, and local taxes for the year amounting to $890,000.00."

Great pride was expressed by Mr. McGrath in the manner in which the employees of the Company are patriotically supporting the war effort by their conscientious work and by the investment of their savings in war bonds. He also paid tribute to those employees now serving in the armed forces of our country by according them best wishes for a speedy victory and a safe return.

R. B. Miles, Western Mgr.

At the Board of Directors' meeting held at the close of the stockholders' meeting the following officers for the ensuing year were elected: Maurice K. McGrath, President; James G. Kellogg, Vice President and Assistant Secretary; H. C. McCluskey, Treasurer; James H. Kellogg, Secretary; Eddis Johnson, Assistant Secretary and Assistant Treasurer. Production for the first quarter this year is considerably ahead for the comparable period of 1942. Because of taxes and the situation pertaining to war orders in general, it is difficult to forcast earnings and anticipated dividend declarations at this time.

E. R. Sears, Asst. Pacific Coast Mgr.

The Kellogg Switchboard & Supply Company will complete its Forty-sixth year of service to the Independent telephone industry of this country on April 28, 1943.

Ray C. Krueger, Advertising Mgr.

Industrial Fire Brigades Training Manual

This 184 page volume, recently published by the National Fire Protection Association, is designed to meet three wide spread demands: First, as a training manual for employees assigned to carry out fire fighting duties under direction of the chief of the private brigade; second, as a reference book in those plants where a fire brigade is already organized, but where the experience of a large group of experts can be profitably utilized; and third, in those plants which need the essentials but not the details of large plant fire protection organization.

The book is divided into 16 chapters as follows: The Industrial Fire Brigade; Forcible Entry Practices; Rope Work; Fire Extinguisher Practices; Ladder Practices; Hose Practices; Salvage and Overhaul Practices; Fire Streams; Ventilation Practices; Periodic Inspections of Plant Fire Protection Equipment; Care of Fire Brigade Equipment; Fire Causes and Fire Hazards; Fire Fighting Procedure; Flammable Liquid and Gas Fires and Special Extinguishing Systems; Electrical Fires; Gas Masks and Rescue Practices.

The private brigade is probably the most important part of the fire safety organization. What to do when a fire occurs is what each member of the brigade must know before a fire occurs. The department heads must know that employees are organized to know how to prevent fires, how to use fire extinguishers, hand hose, and other first aid fire appliances. But it is up to the manager of the plant to arrange for the organization of a plant fire brigade.

The text was prepared by the N.F.P.A. Committee of Firemen's Training, a group of leading fire chiefs and fire protection experts. It is profusely illustrated with drawings and photographs. Page size 8½ x 11 inches. Single copies $1.50 postpaid from the National Fire Protection Association, 60 Batterymarch Street, Boston, Mass.

Ohio Property

The Ohio Bell Telephone Co. was granted authority by the FCC to acquire and operate the toll lines, approximately 58 miles, of the Highland County Telephone Co., a wholly owned subsidiary which operates at Hillsboro and four adjacent small towns southwest of Columbus. The Ohio Bell had previously owned two-thirds of the stock of this company which operates approximately 1200 stations, and recently acquired the remaining one-third. Thus the FCC action enables the Ohio Bell to wipe out the corporate identity of the Highland County company.

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The Runzel Company, doing its utmost in war production, wishes to express appreciation to the Independent Telephone Companies for their continued co-operation. Orders will be accepted as usual and delivered as promptly as possible.

Stromberg-Carlson Company Shortens Firm Name

W. M. Angle, president, Stromberg-Carlson Company.

The Stromberg-Carlson Telephone Manufacturing Company at present engaged in the production of communications equipment for the Armed Forces announced today in its annual report for 1942 a consolidated net profit of $534,053 after deductions of $1,950,000 for estimated income and excess profits taxes (first reduced by a $190,000 post war refund credit) and $200,000 provision for contingencies.

In 1941 the company earned a net profit of $470,073 after deducting $710,000 for estimated income and excess profits taxes and $100,000 provision for contingencies.

According to Wesley M. Angle, president of the company, the profits for 1942 are subject to changes resulting from renegotiation proceedings which will apply to approximately 70% of the company's billings for the year.

"This report, which includes the assets and liabilities of the Canadian company, reflects the increase in our business," he said, "There have been but moderate additions to our fixed assets, and these will be subject to rapid amortization. Current assets, notably cash and inventory, and current liabilities, particularly notes payable, show a substantial increase which parallels the production rate toward which we have been working. Our income account combines the earnings of the Canadian company, the results of our broadcasting operations over radio station WHAM, and profits on sales to our regular customers with returns on our contracts for military equipment, and shows, before taxes, substantial figures. In December 1941, we resumed payment of dividends on our common stock, paying at that time 50 cents a share. A similar dividend of 50 cents a share was paid December 10, 1942."

Angle also said that the rate of shipments had increased sevenfold, at the end of 1942 over 1940. Over half the people employed in the Rochester N. Y. plant are now women. The company is conducting an extensive training program so that workers, both men and women, may be up-graded into more responsible jobs with the least delay.

In pointing up the company's wartime activities the report stated that in 1940 military production was negligible. In 1941, it amounted to appproximately 25% of the total. At the end of 1942, over 95% was directly war production. The joint labor-management production drive committee, formed a year ago, has been actively at work ever since.

Dr. Ray H. Manson, vice president and general manager, Stromberg-Carlson Company.

Stockholders of the Stromberg-Carlson Telephone Manufacturing Company, a New York state corporation with headquarters and factories at Rochester, N. Y. voted March 25, to shorten the corporate name to "Stromberg-Carlson Company." The change in the certificate of incorporation has been ratified in Albany.

In announcing the change, Dr. Ray H. Manson, vice president and general manager, said, "The company will soon begin its fiftieth year, throughout which period its activites have been devoted to manufacturing communications equipment. The stockholders preferred the shorter name and agreed that, whereas telephone manufacturing will continue to be a very important part of the company's production, it was not wholly descriptive of the business."

He pointed out that the operation of a high fidelity cleared channel broadcasting station, WHAM, Rochester, for example, cannot be considered manufacturing nor is it telephone business, except as programs are obtained over telephone lines. He stressed the fact, however, that the company would continue, after the war, to produce telephone and radio equipment, in addition to industrial and commercial communications systems.

"New and broader fields of activity for the communications industry, stemming from developments made in war production as well as from research in connection with wartime communications problems are already in sight, " Dr. Manson said.

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Harry J. Billica Now With Copperweld Sales

W. J. McIlvane, vice president in charge of sales of Copperweld Steel Company announces that Harry J. Billica has joined the Copperweld Sales organization. Mr. Billica was formerly senior industrial specialist in WPB's office of War Utilities at Washington, D. C.

Harry Billica

Before his association with WPB, Mr. Billica was sales engineer for the Indiana Steel and Wire Company, and prior to that was associated with Graybar Electric Company as Pacific district line material manager.

Saxton Named Comptroller Of A. T. & T. Co.

Pierre W. Saxton, assistant comptroller of the American Telephone and Telegraph Company for the past 21 years, became Comptroller on April 1, succeeding Charles A. Heiss, who is retiring, having reached retirement age.

Mr. Saxton, who will pass his thirty-third anniversary of service in the Bell System this year, was born in Otsego County, New York. He attended Harvard University and after graduating from the college of liberal arts in 1908, entered the then newly opened Harvard School of Business Administration and received a master's degree in the school's first graduating class, in 1910.

Mr. Saxton has spent his entire business career in the Bell System, having been employed following his graduation, as a clerk in the Long Lines department of A. T. & T. He rose to the post of auditor of the department by 1919, and three years later became Assistant Comptroller of A. T. & T. A resident of Wilton, Connecticut, he lives on an 8-acre farm there. He is a member of the Harvard and the Railroad Machinery clubs.

Fire Damages Oregon Exchange

Fire, said to have started from spontaneous combustion in the supply room of the Goldendale, Ore., exchange of the Oregon-Washington Telephone Company and causing damage estimated around $5,000 only temporarily held up service to patrons of the exchange according to recent newspaper reports The local volunteer fire department was able to hold the fire within the offices of the exchange. A crew of Oregon-Washington service men were rushed in from Hood River, Ore. and Yakima Valley and restored service very quickly.

J. H. Walls Is New Kellogg Representative

James H. Walls, recently appointed Kellogg service representative in the territory formerly served by T. R. Schweer, is a third generation telephone man who was literally, "born in the business."

As did his father and grandfather before him, Jim has seen service in

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Western Elec. 2-bar Pony type Gen. with Screws and crank @	2.00
Western Elec. 3-bar Pony type Gen. with Screws and crank @	2.25
Electrox Rectifier Type G. B. 110 Volts 60 Cycle complete with 4 Volt storage battery @	15.00
Western Elec. No. 20 AL. Desk stand complete with 3 Cond. cord less signal set @	5.75
Kellogg No. 115 Grabaphones complete with 3 Cond. cord less signal set @	5.00
Stromberg Carlson Desk stand with 3-bar 1000 ohm ringer inside Connection signal set @ $9.25—5-bar @	11.00
Kellogg No. 2696 Modernized 4-bar 1000 or 1600 ohm Bdg. Compacts @	9.00
Stromberg Carlson Latest type No. 896 3-bar 1000 or 2500 ohm compacts	9.25
Western Elec. No. 323 Transmitters complete less backs @	1.15
Western Elec. No. 143 Receivers with repolished shell & New cord @	1.25
Kellogg No. 22 Transmitters complete with back & M. P. @	1.10

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James H. Walls

practically every branch of the industry. This fact brings an assurance to those Kellogg customers accustomed to the fine service rendered them by Mr. Schweer, that they will continue to receive the same intelligent and efficient co-operation.

Mr. Schweer, who has been granted a leave of absence for the duration, is now serving in the U. S. Army Signal Corps where he has been accorded a first-lieutenancy. Prior to entering the service, he represented Kellogg in sections of Ohio, Pennsylvania and West Virginia.

New Pipe Development

Development of a new line of non-metallic drain and sewer pipe, requiring no critical war materials, to replace dwindling supplies of metal pipe has been announced by H. J. Robertson, Jr., President of the Fibre Conduit Co. of Orangeburg, N. Y.

Mr. Robertson's announcement followed reports by the company's technicians of tests showing that the fibre pipe—made of cellulose fibre impregnated with coal tar pitch—is not only a satisfactory replacement but in many cases an improvement over metal and tile pipe for drains and sewers as well as for industrial, home and farm uses wherever pressure is not high.

Mr. Robertson explained that the new non-metallic pipe is resistant to moisture, tuberculation, root growth, corrosion and most dilute inorganic acids and alkalies. He said it was durable, light—can be installed easily and cut to desired lengths with an ordinary

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TOTAL WEIGHT		7 lbs.

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wood-working saw. Couplings maintain pipe lengths in line and provide tight joints if desired, he added.

"Oil companies in Texas, Oklahoma and other fields have installed over a million feet of this pipe in connection with salt water disposal," he said.

The Fibre Conduit Company has manufactured conduit for underground cable protection since 1893 and underfloor electrical ducts since 1923.

Philco Annual Report

Net income of Philco Corporation for 1942, after federal income and excess profits taxes, and after providing a Reserve for Contingencies of $1,000,000, totaled $2,209,992 or $1.61 per share, as compared with $2,513,569 or $1.83 per share for the year 1941, it was announced today by James T. Buckley, president, in making public the annual report for 1942. Included in the earnings for 1942 is the post-war refund of excess profits taxes amounting to $538,792 as provided for by the Revenue Act of 1942.

For continuing excellence of its war production, the Storage Battery Division of Philco Corporation has been awarded a white star to add to its Army-Navy "E" flag, according to word received by M. W. Heinritz, general manager of the division, from Admiral C. C. Bloch, chairman of the Navy Board for Production Awards. The original "E" award was presented to Philco by Rear Admiral Wat T. Cluverius on October 7, 1942.

The Storage Battery Division of Philco is producing batteries for the Army, Navy and Maritime Commission, and plants and facilities engaged in war production.

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8400 ft. 2 reels 51 pr. 26 gauge
4200 ft. 1 reel 51 pr. 24 gauge
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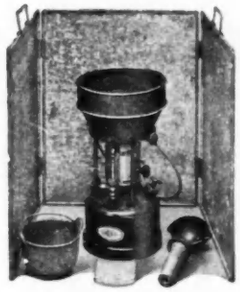

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